



FRIDAY, FEBRUARY 6, 1903.

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## The Trolley Situation in Cleveland.

There cannot be many places in the country where the conditions of local short-haul and long-haul electric traffic can be studied to greater advantage than at Cleveland. With a population of approximately 400,000, Cleveland is the seventh largest city in the United States, following next after Boston and Baltimore, and its topographical situation, with suburban traffic blocked on one side by Lake Erie, throws the residence portion relatively far away from the business streets. The large number of prosperous cities and towns within a radius of 50 miles also occasions a constant interchange of traffic which electric lines are well adapted to handle. The State Railroad Commission has offered no restraint to the incorporation and promotion of an unlimited number of companies. In 1901, for example, 96 electric lines were incorporated in the State of Ohio, with an aggregate nominal capital stock of over \$24,000,000.

A majority of these projects have died a natural death. Other promoters have succeeded in raising enough money to build a whole or a portion of their lines which have then been reorganized and consolidated. The Commissioners state in their report for 1901 that, after numerous reorganizations and consolidations, there were on May 1, 1901, 68 companies operating electric roads in Ohio, and that they work 1,818 miles, equal to one-fifth of the steam main track mileage. The total gross earnings for these electric lines in the year 1901 amounted to \$13,582,651.

The existing properties, particularly in the northern part of the State, with Cleveland as a center, are now beginning to show stability, and a number of through routes have been formed by linking up the loose ends. In the city of Cleveland proper there are two traction companies—the Cleveland Electric and the Cleveland City, more commonly known as the Big Consolidated and the Little Consolidated. The former works about 134 miles of single track, equivalent to approximately half this amount of line; the latter 45 miles of line, and in the division of traffic the Big Consolidated secures about 58 per cent., and the Little Consolidated 42 per cent. The business done by these lines in proportion to the population of the city is very great. In 1896 the total number of passengers carried by the Big Consolidated was 43,000,000, and by the two companies approximately 74,000,000. In 1900, 55,000,000 were carried by the larger company, and 95,000,000 by both. In 1901, the year of the G. A. R. convention, the total figure was approximately 109,000,000, but in 1902, with no especial contributing causes, well over 120,000,000 passengers were carried, and gross earnings were about \$4,400,000, or nearly \$11 per capita for the total population of the city. This compares with \$10.55 in the Borough of Brooklyn, and \$7.90 in Louisville, which has a population of 204,731, and furnishes a better analogy, since it is an independent center of industry.

These city traction lines are the central part of the system. They have been managed progressively but conservatively, and are regarded as thoroughly sound properties. The traffic arrangement in force with the interurban lines provides, in a word, that the latter shall derive only terminal benefits while their cars are in the city. The city lines operate the cars and collect fares, paying to the interurban companies only a nominal trackage sum which is supposed to represent wear and tear

to the rolling stock. The city lines do not consider that they have derived any particular benefit from being thus gratuitously supplied with cars, however, as long interurban cars delay traffic, particularly in getting around curves, and efforts have been made from time to time to separate the local and interurban business at the city limits.

In addition to the country adjacent to the southern shore of Lake Erie, lines in Indiana, Illinois, New York State and even in Texas, have been extensively organized, financed and reorganized in Cleveland, with Cleveland capital, but the electric railroads which are in direct communication with the city are sufficiently characteristic of all the enterprises to furnish ample material for the present discussion. It is an interesting fact that traction stocks constitute the chief sales on the Cleveland Exchange, considerably exceeding all others in the number of transactions, and are held very widely by the banks and trust companies.

The details of the manner in which the various lines were built and reorganized are quite complex, and as they have received much press comment from time to time, it is sufficiently explicit to say that at present the two controlling interests are those of the Everett-Moore and of the Pomeroy-Mandelbaum syndicates, the only independent interurban line out of Cleveland being the Eastern Ohio Traction which has a route to Chardon, Burton, Garrettsville, etc., with about 95 miles of single track. The Cleveland Electric, or Big Consolidated, was allied with the Everett-Moore interests previous to the re-arrangement of their properties a year ago.

In addition to the Northern Ohio Traction line, running to Akron, etc., and comprising a total of about 100 miles of single track, Everett & Moore had practically a through route from Painesville, on the east, along the southern shore of Lake Erie, to Toledo, and continuing up to Detroit, with extensive control of the city lines in Cleveland, Toledo and Detroit, and many subsidiary properties such as the London, Ont., street railroad system, but they undertook to do too much, with a general scheme of capitalization based chiefly on futurity, and, partially through the large collateral holdings in the Federal Telephone Co., the syndicate found itself in difficulties at the close of 1901. Upwards of 30 Cleveland banks were its creditors. Many of the properties showed great promise, and after a reorganization committee composed of seven Cleveland bankers had assumed control, the creditors showed a general disposition to grant an extension of time. This is still in force, expiring in July, 1903, and as matters now stand, the re-adjustment seems to have been successful, partly due, no doubt, to the great prevailing prosperity and the general increase in values. Certain portions of the holdings have been sold at unexpectedly high prices, but the only property which passed entirely out of the Everett-Moore control is the Big Consolidated, in Cleveland, which was sold to a syndicate of Cleveland men at \$80 per share.

Pomeroy & Mandelbaum control the Cleveland, Elyria & Western system, which was reorganized Jan. 21, 1903, under the name of the Southwestern Traction Co., and has a total line about 170 miles long, with 25 or 30 miles of extension to be built in the near future. This is exclusive of a number of isolated systems in the western and southern parts of Ohio and elsewhere, which are under the same control, and aggregate about 350 miles, but do not properly belong in the Cleveland group. The capitalization of the Pomeroy-Mandelbaum properties in the vicinity of Cleveland has been fairly conservative and they are in prosperous condition at the present time; in 1901, on about 62 miles of line worked, gross earnings were \$249,259; net earnings were \$112,394, and interest absorbed \$57,022, leaving \$55,371 applicable to dividends on \$2,000,000 capital stock. The Southwestern Traction Co., capitalized at \$5,000,000, will operate practically 200 miles of line, when completed.

It is scarcely necessary to say that the most striking feature about the development of these Cleveland lines has been their absorption and creation of short-haul passenger traffic. The following table, showing the number of passengers carried between characteristic short-haul points east and west of Cleveland in 1895, when the electric lines were being built, and during subsequent years to the present, shows with great vividness the losses which the Lake Shore & Michigan Southern has sustained on this kind of traffic since the electric systems commenced active operations.

Passengers Carried Between Cleveland and Oberlin and Intermediate Points.

	Westbound.	Eastbound.	Total.	Average per month.
1895.....	104,426	98,588	203,014	16,918
1896.....	71,416	63,577	134,993	11,249
1897.....	63,777	57,756	121,533	10,128
1898.....	37,641	34,919	72,560	6,047
1899.....	36,445	35,310	71,755	5,979
1900.....	41,689	41,257	82,946	6,912
1901.....	48,654	47,586	96,240	8,020
1902.....	46,328	45,433	91,761	7,647

Passengers Carried Between Cleveland and Painesville and Intermediate Points.

	Westbound.	Eastbound.	Total.	Average per month.
1895.....	97,460	101,832	199,292	16,608
1896.....	74,531	79,951	154,482	12,874
1897.....	34,068	36,666	70,734	5,895
1898.....	26,418	28,727	55,145	4,595
1899.....	19,540	22,129	41,669	3,472
1900.....	15,835	18,776	34,611	2,885
1901.....	12,530	14,595	27,125	2,261
1902.....	13,106	15,692	28,798	2,392

Westbound traffic between Cleveland and Oberlin decreased 56 per cent., that is to say, between 1895 and 1902. Eastbound traffic decreased 54 per cent., and the average per month of both, 55 per cent. Westbound traf-

fic between Cleveland and Painesville decreased 87 per cent., in the same period, and eastbound traffic, 85 per cent.

It is to be regretted that records are not kept by the electric lines concerned, which would enable a parallel to be shown. The Cleveland, Elyria & Western kept such figures for a time with great care, but did not consider that the expense of the extra clerical work involved was justified, and has discontinued the practice; hence it is only possible to show the traffic over the entire system, which goes beyond Oberlin, the competitive point quoted by the steam road to Norwalk, etc., covering practically the same intermediate towns as the Lake Shore & Michigan Southern, and a number of others as well. In 1899, 952,602 passengers were carried; in 1900, 1,353,514; in 1901, 2,296,280. At the present time the traffic is estimated at from 8,000 to 10,000 passengers daily, so that a conservative figure for 1902 would be 3,000,000, or considerably over three times the number carried in 1899. It is true that the mileage worked in 1902 was somewhat greater than that worked in 1899, but the figures, nevertheless, show what has become of the missing short-haul traffic. In the other direction, the distance from Cleveland to Painesville, via the electric line, is 30 miles, and the chief part of the interurban traffic is doubtless confined to the half of the route nearest Cleveland; yet, giving a total which combines the shorter haul with the longer, the number of passengers carried by the steam road in 1902 was just over one-seventh of the number carried in 1895. The suburban business to Berea, which is about 10 miles from Cleveland, was formerly quite important to the steam road. At the present time it may be fairly said that it has no traffic at all, except where the passengers buy a ticket with a view to checking baggage through. The trade has been entirely diverted to the Cleveland, Elyria & Western.

The following is a statement of passengers carried between Cleveland and Lorain, 26 miles, on the New York, Chicago & St. Louis, which is paralleled by the Lake Shore Electric:

Year.	Number of passengers.	Revenue.
1895.....	42,526	\$25,523
1897.....	12,413	5,657
1901.....	11,539	4,893
1902.....	9,795	4,379

The traffic for the past year, that is to say, was less than 10,000 passengers, as against over 40,000, seven years ago. It is only fair to state, however, that an unusual increase of traffic was occasioned in 1895, by the building of a new plant at Lorain.

The difference in fares is less than would perhaps be expected. The one-way rate on the Lake Shore & Michigan Southern comes to about three cents per mile, and the round-trip rate is approximately 2½ cents. The greater convenience attendant on the terminal facilities and the frequent running time of the electric cars gives them such an advantage that the steam roads make little or no effort to compete, and admit frankly that they no longer have any real share in the interurban business within a radius of 10 to 15 miles of Cleveland. Exclusive of the cost of motive power, a trolley car with a crew of two men can often do the work of a light suburban train, which will require a crew of six or seven, including the station force.

It is difficult to obtain exact figures to show how much of the business of a given electric line goes to the longer haul. When the lines were first built, a large number of passengers would travel over them for distance of 30 or 40 miles: in part, no doubt, because of the novelty. At present there seems to be a slight reaction from this, with a likelihood that the long-haul electric traffic will not show material changes in the future. It has been estimated that the through traffic on the line from Dayton to Cincinnati, under practically similar conditions to those at Cleveland, is about 15 per cent. of the total business, and in this case the distance is 57 miles, so that it is evident that a certain number of passengers will always be attracted by the lower rate of fare prevailing, in spite of the greater time required to complete the journey.

The amount of business which the interurban lines have created is much more difficult to determine than the amount of business they have absorbed, and it can only be indicated by the rapid development of suburban properties since 1895, and the great traffic increases on the electric lines, not assignable to any other specific cause. The electric roads around Cleveland have been changed and reorganized to such an extent that it is difficult to secure comparative figures for any length of time, but the following table shows the increase for a single year in the business of the existing properties, and also gives the returns for 1897, from the two companies which were then worked in the same form. The total earnings of all Cleveland traction lines in 1896 amounted to approximately \$3,000,000. The total earnings of all Cleveland traction lines in 1902 amounted to over \$6,275,000.

Earnings for 1901 and for Ten Months of 1902.

	1901.	Jan. 1-Oct. 31, 1902.	1897.
Cleveland Electric.....	\$2,273,636	\$2,126,660	\$1,632,034
Cleveland City.....	1,680,934	1,540,000	...
Northern Ohio Traction...	617,011	617,526	...
Lake Shore Electric.....	358,180	373,850	...
Cleveland, Elyria & West.	249,259	251,033	...
Eastern Ohio Traction...	138,366	161,071	...
Cleve., Painesville & East.	164,971	160,677	87,533
Total earnings.....	\$5,482,357	\$5,230,814	...
Average per month.....	456,863	523,081	...

The managers make efforts in many ways, not merely



to provide facilities but to popularize the service; for example, it has been customary to regulate the time of departure of the "commuters" afternoon car on the Cleveland & Painesville route in accordance with an actual vote of the passengers, taken from time to time by the conductor. Even if the actual convenience thus afforded were slight, the asset obtained in good-will is doubtless of considerable value. In general, the interurban cars leave the center of the city once an hour all through the day, so that their time-table is easily memorized.

Another well-developed competitive feature of the electric roads which is doubtless capable of still further enlargement, is their express business. The general way in which this is conducted presents no features of especial interest; there is an organization known as the Electric Package Company, worked jointly by the Lake Shore Electric, the Cleveland, Elyria & Western, the Cleveland, Painesville & Eastern and the Northern Ohio Traction lines, which covers a suburban territory in and about Cleveland of almost 400 miles, and handles baggage upon the same conditions as the steam roads, and light matter similarly to the express companies. But, as in Albany and its environs, the express business includes a large amount of what would ordinarily be classed as freight, including such articles as garden truck, beef and live calves.

The Electric Package Company has been in business four years and reports a rapid and steady increase in traffic. At present approximately 22 express cars make round trips each day. The idea of handling this traffic chiefly at night, and during times when the lines are least crowded, does not seem to have received any special consideration. The eventual competition with the steam railroads of this package and freight business has not yet received much publication, but if it continues to increase at the present rate, it will soon be a serious factor. At present the electric package and express business of the lines of the Cleveland, Elyria & Western alone amounts to something like \$15,000 a year, and is showing rapid increases month by month.

Viewed as carriers, the most serious obstacles to the development of the electric lines under present conditions seem to be their location to a greater or less degree on the highways, and the rather temporary manner in which they are built. The track and roadbed, in general, are not of sufficiently enduring character for continued economical operation. A considerable part of the system needs entire rebuilding, partly on private right of way, and the capitalization, in general, is at so high a figure that a good deal of financial reorganization will be necessary before this can be accomplished. Portions of the line are solidly built and require little attention for maintenance, but, as a rule, the building was too rapid. The promoters were too much impressed with the fact that it was to their interest to have a line on the ground instead of on paper, and the roadbed, consequently, is not adapted for the large and increasing traffic. The present capitalization of the Lake Shore Electric is at the rate of something like \$83,000 per mile, of which the bonds constitute about \$33,000 per mile, so that the stock bears no relation to what the Massachusetts Commissioners call "fair replacement value," yet a large sum is needed to put this property in first-rate shape. It furnishes an example somewhat more striking than that of most of the other lines, however, because it went into the hands of a receiver before it was completed. It has been estimated that half the expense of working a trolley road is in car service, and hence the cost of maintaining grades, curvature and unsubstantial roadbed increases in rapid proportion to the traffic, as measured by the number of cars required for a certain service.

If the electric lines, not alone in the Cleveland district, but in similar localities throughout the country as well, are eventually taken off the highways and put on private cross-country right of way, the service between the terminals will be greatly improved, and this proposition is receiving much agitation in Cleveland at the present time. But another factor is here introduced for consideration; the traffic from one town to another along the route. The belief seems to be gradually arising among the Cleveland interurban interests, and elsewhere, that there must eventually be three services performed by transportation lines in populous territory. The long-haul of 50 miles or more is the function of the steam railroads and does not seriously interest the traction men as being likely ever to contribute largely to their earnings, but it is believed that the "commuter" traffic from city to suburb, and the haul of 15 or 20 miles between neighboring cities, must be separate from the town-to-town business along the way. It is thought that this can be best accomplished by building new lines on private right of way for the through business of the electric roads, while the present highway service should be maintained as it is, to pick up local traffic on the way.

In the vicinity of Cleveland, and in other localities where the State railroad commissions offer no particular restrictions, it seems not unlikely that the carrying out of this idea will eventually introduce a further element of competition with the steam lines by considerably extending the competitive area. The cost of building the third road would, in many cases, be no greater than the cost of putting the existing highway routes in shape for economical, high-speed operation, and the necessity for some change of this sort is becoming more and more apparent because of the constant conflict between through

business and local business when carried over the same tracks. A parallel is furnished by the two services performed on the New York Elevated railroads, and the service performed by the street lines beneath. The function of the express trains on the elevated corresponds to the long-haul, best performed by steam railroads. Local elevated trains correspond in smaller scale to the through service between neighboring cities, and the traction lines in the street furnish a parallel to the highway traffic.

The uncertainty about the electric situation arises chiefly from the fact that it is hard to predict just when the limits of the present expansion in traffic will be reached. For the last two or three years, the roads have been amply justifying all expenditure made for their improvement, and it has been correspondingly easy to market considerable increases in their securities. It is not felt that any of the Cleveland properties have as yet even approximated their limit.

#### The Teton Bridge.

The Teton bridge, crossing the Teton River 45 miles north of Great Falls, Mont., has recently been completed for the Montana & Great Northern, formerly known as the Great Falls & Canada. It stands 110 ft. above the mean level of the river, and is 2,333 ft. long. The wood used is Washington fir, and the structure will eventually be replaced by a steel bridge. Except for a deck Howe truss span, 150 ft. long, over the bed of the river, the crossing is built entirely of wooden trestle, resting upon 800 piles, none of which is less than 10 in. in diameter at its smaller end.

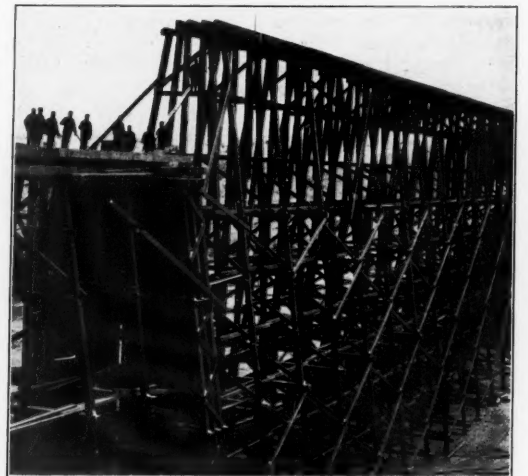
The crossing of the Muddy River, less than a mile north, involved another trestle, 105 ft. high and 903 ft. long, in which 750,000 ft. of Washington fir were used. This structure also contains a Howe truss span, 120 ft. long.

#### Wheel Flange and Rail Wear.

BY H. M. PERRY.

The subject of wheel and rail wear and of the additional consumption of fuel caused by this wear, is a matter of recognized importance. A change in a locomotive which promises a saving of a few pounds of coal per mile run is probably made; but a change in the

friction on side bearings? On all this class of heavy equipment the body and truck bolsters have been designed to carry the load on the center plates, keeping the side bearings free. But are the side bearings free on cars running around curves? Does not the centrifugal force roll a car body over on the outside side bearings with almost as much weight as though the load were carried on this same bearing? And do we not find these same bearings almost as much worn as



The Muddy River Crossing—Montana & Great Northern.

those on which the load rests? Such is the result of my investigation on the comparatively small number of cars on which the side bearings were not carrying their proportion of the load.

The very fact that the great majority of wheels are removed from this class of cars on account of worn flanges seems to disprove the theory that the remedy for worn flanges is to keep the side bearings free, and emphasizes the fact that our only hope is in a suitable anti-friction side bearing, which will allow the truck to swing freely within proper limits and to have sufficient bearing surface to support any load which it may be called upon to carry.



The Teton Crossing, Montana & Great Northern Railroad.

construction of the car equipment which will make a saving in this same direction will probably escape notice.

On the old light-capacity equipment the matters forming the subject of this article were considered a natural result of operating trains, and very little attention was paid them. But when the modern heavy-capacity cars came into use in sufficient numbers to offer a comparison, the increase in wheel wear was so marked as to attract immediate attention; and now much is heard of the excessive wear of rails on curves from this same cause. Lately the statement has been made that on the Pennsylvania system the failure of wheels under 100,000-lbs. capacity cars as compared with cars of 60,000 lbs. capacity, was as 3 to 1; and compared with the 40,000-lbs. capacity cars the ratio was 5 to 1; also that from statistics compiled from the records of the Pittsburgh & Lake Erie, the average life of cast-iron wheels under 60,000-lbs. capacity cars was 52 months, while under the 100,000-lbs. capacity cars the average was only 32 months; and the removals were due to worn flanges. A suggestion was made that the weight of wheels be increased, also the thickness of flange; but I fail to see where this would remedy the trouble, since when the face of the flange is worn perpendicular for more than  $\frac{1}{4}$  of an inch the wheel must be removed whatever the thickness of flange.

Would it not be more reasonable to look further for this trouble? Is not this excessive flange wear due to

Several thousand cars have been equipped with various anti-friction side bearings in the past four or five years and are showing very gratifying results in the reduction of flange wear. This is notably the case in the tests made on the Lake Shore & Michigan Southern in 1898, a record of which was published at the time, with illustrations showing the wheel wear on cars which had run over 70,000 miles, and showing from 25 to 50 per cent. saving in wheel wear in favor of roller side bearings. In another test on heavy passenger equipment a saving of 17.5 per cent. in wheel wear was shown in favor of roller side bearings notwithstanding that the trains which were equipped with the rigid side bearings were in first-class condition and the side bearings given the ordinary amount of clearance.

If these results can be obtained on passenger equipment, what should be the results on freight equipment, which is not given one-half the attention which our passenger trains receive? In one test on heavy-capacity special freight service, the average weight of car and load being over 120,000 lbs., roller side bearings have been running over 17 months, with a total mileage of over 60,000 miles, and the wheels show no perceptible flange wear; and, from present indications, should run 30,000 miles more before removal. On this car almost the entire load is carried on the side bearings, due to the excessive deflection of the body bolsters, and is a practical demonstration that a heavy-capacity car can be

safely carried on three points on the truck as well as on one, and at the same time reduce flange wear to a minimum; it also offers a solution as to the cause of flange wear on heavy capacity cars.

In this same connection it might be well to consider the question of flange wear on our old light equipment. It is generally conceded that about 35 per cent. of all wheels are removed for sharp flanges; and when we take into account the fact that we have running over 1,000,000 cars of 60,000 lbs. capacity or less, and the majority of them carrying a large part of the load on the side bearings, it can be readily seen that there is a promising field for improvement and a great future for roller side bearings, not only in reducing this enormous amount of flange wear but the corresponding rail wear which occurs from the same cause. And when we concede the point that this additional wheel and rail wear represents a large increase in the consumption of fuel on our locomotives, the possibilities for improvement in this direction become of vital importance.

#### New York Central Improvements in the Bronx.

Reference was made recently in the article on the proposed changes in the New York Central terminal, to the removal of grade crossings which was also to be effected in the Borough of the Bronx. The present plans, as shown in the key map, provide for a cut-off along the

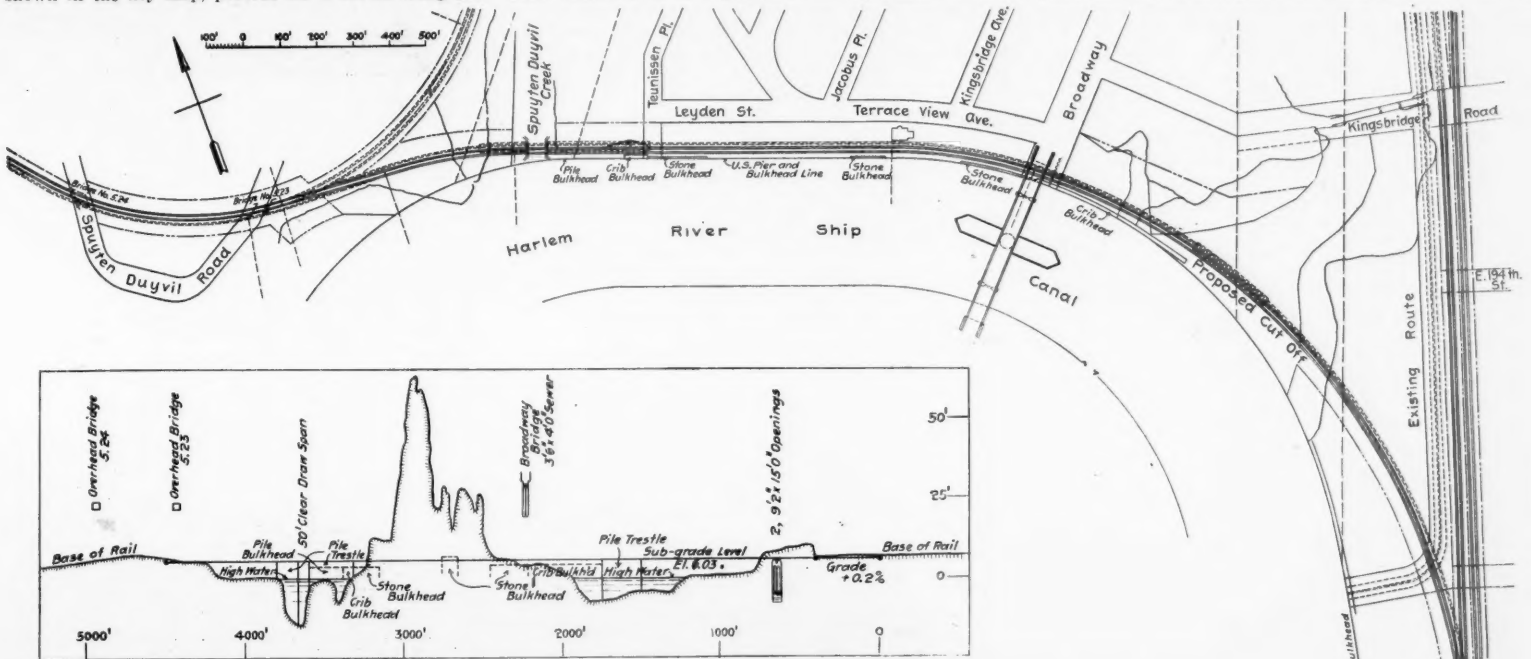
Game. It was considered that the serious nature and extent of the floods in a large number of streams throughout the State has been a source of considerable injury and danger, and that progressive changes in forestry cultivation, density of population, etc., had tended to increase these conditions. The Commission was ordered to proceed at once to make surveys and investigations to determine the causes of overflow of the various rivers and water courses within the State, and to determine what could be done to prevent it, and \$5,000 was appropriated for its needs.

After outlining in detail the work done during the year, results and conclusions are given showing that the damage caused by floods in New York State during 1902 aggregated more than \$3,000,000, and that in addition to the pecuniary damage, the loss and danger to life, the causing of extremely unsanitary conditions, the serious inconveniences and interruption to private and public activity, etc., comprise a list of flood results that can neither be assessed nor compensated. Moreover, the ills suffered by the people from floods are rendered the harder to bear by the knowledge that in most instances the floods themselves may be either prevented or mitigated. Reason and experience have taught but two methods of regulating floods; the first by enlarging and altering the channels to provide sufficient outlet for the flood flow, and the second by storing the flood waters in reservoirs to be used whenever it is expedient; the regulation of each

marshes, which aggregate not less than 200,000 acres within the State and include some of the most fertile and productive lands, when properly drained and cultivated.

In addition to these considerations, the services of such a system in the development of water power would be of great importance. The Black River, for example, has a watershed of about 1,900 square miles, with a maximum flow of over 30,000 cu. ft. per second, and a minimum flow of less than 500 cu. ft. per second. The water power developed on this stream is at present rated at 76,000 h.p., but the assistance of steam plants is necessary, to furnish this power in the dry season, and, if rated on the low-water flow, it would not aggregate more than 30,000 h.p. The Commission estimates that if the flow of the Black River were controlled by storage, which it considers perfectly practicable, it would render over 120,000 h.p. available. In view of the fact that the agricultural resources are well developed, and that the recent growth of the State has been largely dependent upon the growth of manufacturing industries, and that future progress evidently depends upon the same, the Commission believes that this method of river regulation has become a public utility of the first order on the grounds of power increase alone, without regard to the other important considerations mentioned.

There are many groups of individuals, and many corporations, whose interests would long since have induced



Plan and Profile of Marble Hill Cut Off—New York Central & Hudson River.

northerly shore of the Harlem Ship Canal, in place of the present long loop. This takes out all the grade crossings in that neighborhood, a total of eight, and leaves only three within the limits of Greater New York, on the main line. At each of the latter, the highway will be carried across the tracks on an overhead bridge, and it is proposed to equip these with suburban stations on the higher level, with stairways leading from the platforms to the tracks, so that passengers will not be obliged to cross the tracks at grade for access to the station.

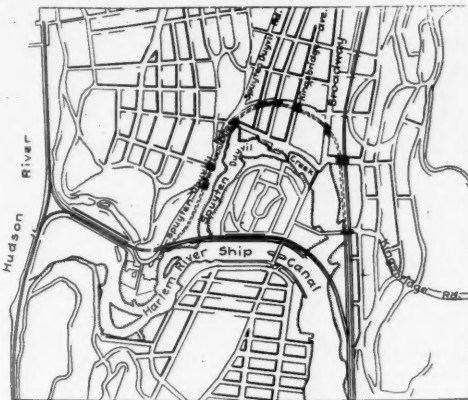
The route along the ship canal, besides doing away with the eight grade crossings previously mentioned, of which all are at present dangerous, will cut about three-quarters of a mile off the main line distance. No change in the grade of the existing streets will be required, except in the case of the three supplemental crossings. The total curvature of the existing line is about 203 deg.; the new line will be about 106, or not much more than half. The maximum existing curvature at Marble Hill is 7 deg., the maximum to be established is 5 deg., 25 min.

#### Report of the Water Storage Commission.

The New York State Water Storage Commission, appointed by Governor Odell last April, has made its report to the State Legislature. An act to provide for the appointment of this Commission to investigate the causes of floods and overflows of rivers and water courses, and to make recommendations for preventing the same,

particular stream to be determined by the characteristics of its watershed.

The reports of the sub-committees show that circumstances permit of storing the flood waters of most of the important streams in the State by means of reservoirs on the streams themselves, or upon their tribu-

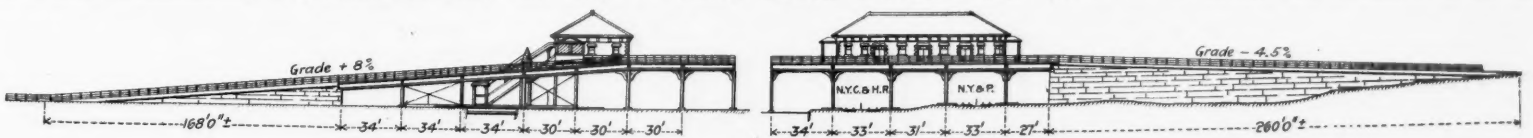


Key Plan, Showing Grade Crossings to be Removed.

taries, and that this can be done at moderate cost. The reservoir method of regulation presents great advantages over the plan of channel improvement because it tends

them to carry out one or the other of these methods of regulating streams, had they not found it impracticable to do so under the present law, which gives to every riparian owner, however small and insignificant his holding, the power to enjoin any change in the natural condition of the stream his holding abuts upon, no matter how salutary or important its regulation might be to his own interests, or to those of the community at large. The Commission feels that this is largely owing to this medieval condition of the law and that New York is behind many of its sister States in the development of manufacturing industries by utilizing water power, since elsewhere the right of eminent domain, under certain regulations, has been conferred by "mill acts" to individuals and corporations.

The reclaiming of marshes has been hindered by the same difficulties, and mutual effort without some central official agency is inadequate to carry through the needed measures. The existing State Drainage Law, which was enacted in 1869, and has been amended periodically since that time, meets fairly well the reclamation of small tracts where only a few interests are involved, but is inadequate in the case of large undertakings, and it would be entirely feasible to frame a general law which should provide for the drainage and reclamation of the large



Suburban Station at Street Level—Highbridge, N. Y.

with an appropriation therefor, became a law April 7, 1902. The Governor appointed Olin H. Landreth, John L. King, Elnathan Sweet, Geo. W. Rafter and Geo. R. Finch to serve with John C. Davies, Attorney General (whose place was subsequently taken by Mr. Cunneen); Edward A. Bond, State Engineer and Surveyor; Chas. S. Boyd, State Superintendent of Public Works, and D. C. Middleton, State Commissioner of Forest, Fish and

to produce a uniform flow throughout the year. This has an important effect on sanitary conditions by affording a pure municipal water supply to many cities and towns, and by preventing malarial conditions from decaying vegetation resulting from overflow, by permitting the free operation of sewer systems, now periodically interfered with by freshets. The reservoir method of regulation is also important to river navigation, to the reclaiming of

areas of swamp and wet lands in the State, in common with flood prevention.

The Commission believes that State supervision and control is the safe method of intelligently carrying out an adequate system of river improvement in New York, and that such control by a commission of recognized competence and character would not only secure the scientific treatment of each stream, as a whole, but the safe



and economical execution of the various component parts of a comprehensive system of river improvement, in the order of their relative urgency and importance, and it considers that legislation to provide for this is a great and urgent public necessity. It is recommended that the inauguration and execution of the system be entrusted to a permanent commission, the central idea being that the entire cost of the execution and maintenance of each of the various separate works should be borne by the beneficiaries in proportion to the benefits they derive from it, and that the initiative of a work of improvement under the act should be by publication by the commission of a notice of intention to make the improvement, or by petition by riparian owners showing the facts from which they deem it necessary to regulate the flow of the stream in the interest of the public health and safety. It should be the duty of the commission to investigate the subject matter presented in such petitions, and to approve or disapprove the work contemplated, and the commission should further have power to prepare necessary maps, specifications, etc., and to carry out the work by contract. It is obvious that the act must confer the right of eminent domain for the acquisition of the necessary property rights, and it should clearly provide adequate machinery for carrying out condemnation proceedings, reserving the right of appeal conferred by similar existing statutes. When the entire cost of any such improvement has been ascertained, the commission should apportion the aggregate cost equitably, and methods of collection conformable to the tax provisions of the statutes should be provided.

The present commission closes its report with a statement of its belief that the prompt inauguration of such a policy by the Legislature would more profoundly promote the progress and prosperity of the commonwealth than any public enterprise to which its attention can be directed.

#### The Westfield Collision.

The collision on the Central of New Jersey on the evening of January 27 should be recorded under the above title, as Westfield and not Cranford is the station next east of the point of collision. The statements given in our account last week (page 88) are in general correct, except as regards the distances. At the present writing, the number of passengers killed or fatally injured is 21, and of employees one (Engineer Davis of the Philadelphia train). The fireman of this train was injured, and the number of passengers injured is about 40. The collision occurred about 6:30 p.m., more than an hour after sundown. Engineer Davis said, before he died, that he had turned his attention to the injector of his engine, to tighten the union between the injector and the boiler, which was leaking a good deal of steam; and that he must have kept his mind off from the signals longer than he intended to. Davis was in a critical condition constantly from the time of his injury until his death and his mind was clouded; but his statements, to his brother, to a policeman and to the physician appear to have been rational and clear. The evidence shows that he passed at least two red signals, and one distant, besides that of the brakeman, who was back about 900 ft. from the rear of the preceding train. The distances of the respective warnings are shown by the sketch below, in which T indicates the rear end of the standing train. One story is that Davis told a policeman that the brakeman's torpedo was the first warning that he apprehended; and he is also quoted as saying that when he first looked ahead after taking his attention from the injector the tail

and one behind it). Davis says that he did not see the train ahead of him until within 60 ft. of it, although a passenger is reported as saying that Davis heard the torpedo put down by the brakeman, which was several hundred feet back of the Easton train. The written statements are, however, evidently not verbatim, although one of them was sworn to and subscribed to by Davis. Other witnesses testified that the steam chest had been leaking for a month. The engine had been in the shop from January 9 to January 16, and the crack had been repaired "as well as possible." Three enginemen testified that No. 27 was in good condition. Davis was 34 years old and had been an engineman for 12 years.

The engine, as just stated, belongs to the Philadelphia & Reading, by whom Davis was employed. The Reading and the Central each run many trains through over the other's tracks and, indeed, the two roads are under a single control. An officer of the Reading says that Davis was from outward appearance almost the ideal engineman; young, intelligent, of good physique and with a good record of six years on fast trains and 10 or more years in lower places.

#### The President of Stevens Institute.

On Thursday afternoon of this week the official inauguration of Mr. Alexander C. Humphreys as President of the Stevens Institute of Technology took place at the Carnegie Laboratory of the Institute, and in the evening there was a dinner in his honor at Sherry's, in New York City. We must write before the event, and therefore cannot tell what took place, but the occasion was one of unusual interest in several respects, and it should be particularly interesting to readers of the *Railroad Gazette*, for Stevens Institute has furnished to the railroads and



Alexander C. Humphreys.

to the manufacturing establishments a great number of engineers of reputation and influence. The present distribution of the alumni is given in the list below.

Superintendents and managers of the entire business or of important departments of shops and engineering works	251
Consulting engineers, carrying on professional work on their own account	61
Professors in technical or engineering colleges or schools	40

he might acquire; but, actuated by a fine sense of duty and by a noble appreciation of the opportunity to do good to young men and to the nation he set aside his great business and professional interests to take the Presidency of the Institute. The business of his house, Humphreys & Glasgow, will be carried on, and he retains his interest in that house, and, naturally, will do a good deal of professional work, but the work to which he has now set himself most seriously is that of administering the affairs of the Institute. Such a conception of duty and opportunity is rare, and the results as measured by his influence upon the young men and through them upon the country are bound to be great. We surmise, but this we have never been told, that in some degree he regards the work which he has now taken up as a kind of memorial to his son, a graduate of Stevens Institute, who was drowned in the Nile a year or two ago, and a few months after his graduation and his marriage. This son was drowned in an unsuccessful attempt to save his younger brother, who had fallen overboard. It was an heroic as well as a tragic episode, but if our conjecture is correct, it will bear noble fruit in the future work of President Humphreys.

Mr. Humphreys is within two months of being 50 years old. His name, Alexander Crombie Humphreys, indicates his nationality, and, in fact, he was born in Edinburgh, his father, E. K. Humphreys, LL.D., having been a scholar and a teacher. Mr. Humphreys was 30 years old when he was graduated from Stevens and was a married man with (we believe) two children. During his college course he had supported his family by his work as secretary of a gas light company, and he attended lectures and recitations only two mornings each week at the Institute. Notwithstanding his heavy handicap he was one of the most distinguished students of his class. After graduating he became chief engineer of the Pintsch Lighting Company, and four years later became Superintendent of Construction of the United Gas Improvement Company, of Philadelphia. Here he made a rapid and great success, shortly becoming General Superintendent of the concern, from which he resigned in 1894. He had already established the firm of Humphreys & Glasgow, his partner, Mr. Glasgow, being also a graduate of Stevens Institute. The firm established offices in New York City and in London, and the apparatus designed by the firm has been installed in many cities all over the world. Mr. Humphreys has always been interested in the affairs of Stevens Institute and has been an active member of the Board of Trustees.

#### Virtual Grades for Freight Trains.

We reprinted in our issue of Dec. 5, 1902, a paper on the above subject which was presented to the American Society of Civil Engineers by Mr. A. C. Dennis, M. Am. Soc. C. E. From the discussion which followed the presentation of that paper we abstract the following:

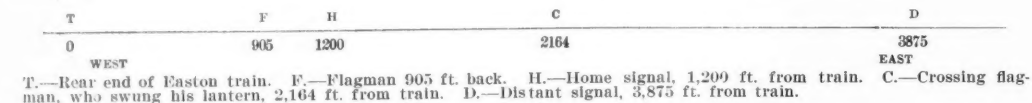
C. D. Purdon, M. Am. Soc. C. E.—The only objection that the writer has heard made by engineers is that, in case of a train getting stalled at the foot of a grade, it would not be possible to start again with the maximum load; and for this reason some engineers advocate that in reducing grades they should always be reduced to the new maximum, regardless of their length. If this were done, however, the operating department would, no doubt, find out in a short time what maximum load could be operated over the reduced grades, and would undoubtedly use that load; so that it would seem advisable in grade reductions to take account of the momentum. This, however, the writer would only advocate in connection with the reduction of grades on an existing road.

In building a new road he would not exceed the maximum grade adopted in any case, as the principle of momentum afterward applied would simply make the new road so much the better, besides which, on a well-established road the stations have already been settled, and the stopping points for trains, at stations, water tanks, etc., have been established, so that the momentum can be calculated with considerable accuracy. On a new road, all these points will come up later, and if momentum grades were established on a new road, the introduction of a water tank or a new station, or some other reason, might destroy all calculations.

William G. Raymond, M. Am. Soc. C. E.—While we engineers are figuring theoretically the gains to be secured by the consideration of momentum or velocity grades, and while the western roads have, in many instances, laid out such grades and operated them with apparent success and economy, we are met by the manager of the busy eastern road with the statement that on his road he does not dare to start out a train the engine of which is loaded with a load greater than that with which it can start from a state of rest on the steepest *de facto* grade over which it is to pass.

Considerable economy may result from a consideration of momentum or velocity grades, in the cost of original construction, in the revision of gradients on existing roads, and in the designs of motive power and its operation; nevertheless on a busy road the cost of a single unexpected stop, due to too close figuring on the possibility of momentum grades, may equal or exceed the gain resulting from such considerations for a considerable period of time during which there is no such accidental stop.

A. C. Dennis, M. Am. Soc. C. E.—The boiler momentum, though not capable of being calculated exactly, should be considered, and has been rather undervalued, as trains require more speed and hold it better when run-



lights on the rear car of the Easton train were immediately in front of him. The flagman at the highway crossing C swung his lantern because he saw the swinging lantern of the brakeman at F. The line on this part of the road is straight for eight miles. The crossing flagman, and numerous other witnesses, testify to the heedlessness of the engineman. During all the time that the engineman was attending to his injector the train was traveling at probably 60 or 70 miles an hour, and the fireman was down behind the fire-box, about 10 ft. in the rear of the engineman. The engine, No. 27, of the Philadelphia & Reading, was of the well-known Wooten type, with a fire-box about 8 ft. wide, and with the cab on the boiler in front of the fire-box. The injector was immediately in front of the engineman.

At this writing the Coroner has held one session. The hearing was devoted chiefly to evidence concerning what Engineman Davis had said and to the testimony of the master mechanic and road foreman of engines. Written statements from Davis were presented by County Physician Westcott and by Justice Huff. The substance of these is that Davis's regular engine had been disabled the morning before the accident and he had taken from a local train engine No. 27 of the Atlantic City Railroad. On this engine the left steam chest was cracked, so that steam leaking from it interfered with the engineman's view and he had to shut off steam in some cases in order to see signals. The statement says that "the front injector broke." (It would appear that No. 27 was one of the engines in which the two injectors are within the cab on the engineman's side; one in front of his seat,

Assistant engineers or superintendents in mechanical establishments	73
Presidents, vice-presidents, secretaries and treasurers of manufacturing companies	75
Employed in designing, drawing and superintending construction of machinery	244
Patent lawyers and solicitors, agents and inspectors for manufacturing companies	40
Superintendents of motive power and general foremen, etc., on important railroads	17
In employ of foreign corporations (not classified as above)	13
Editors of engineering journals	7
Architects	4
Chemists	4
Present occupations unknown or not classified	103
Deceased	55
	987

The number of Stevens' graduates occupying high positions is less than of the graduates of the Rensselaer Polytechnic Institute, because the latter had the field to itself in this country for many years, being the oldest civil engineering school in any English-speaking country, while the Stevens Institute only began work in 1871. But the standard has always been high, the course is famous for its thoroughness and there are no graduates in mechanical engineering who, as a body, stand higher than those of the Stevens Institute.

But present interest is particularly in the President himself. Mr. Humphreys took up the duties of this office last September. He had reached a place at the top of his profession as a gas engineer. His business had spread throughout the civilized world. There was no reasonable limit to the fortune and the professional fame that



ning for momentum grade than is indicated by the diagram, except for long hills, where the diagram falls short, as noted.

The problem of momentum grades contains so many personal, mechanical and other variables, that an approximate solution only is possible. A close approximation only is necessary, as trains are not loaded ordinarily to

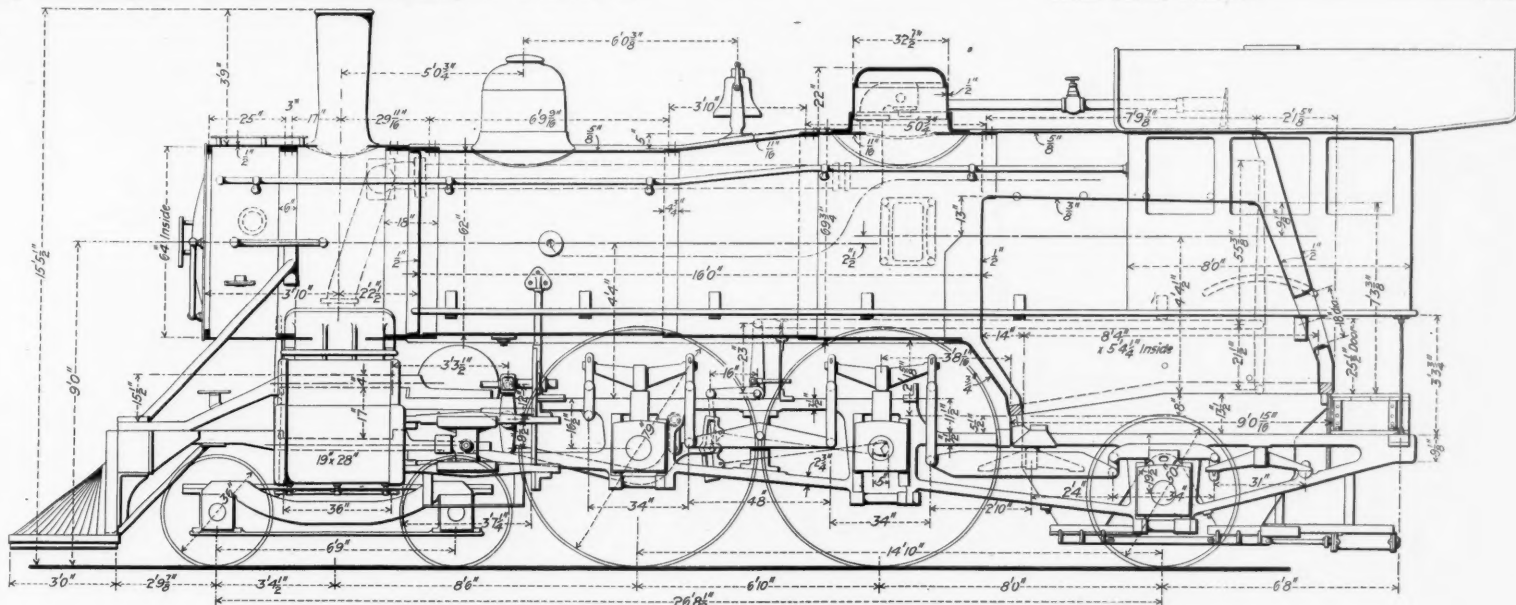
between the rear drivers and trailing truck and the ash pan, which is operated by compressed air.

The maximum tractive effort, assuming that 85 per cent. of the boiler pressure of 200 lbs. is available at starting, is 21,800 lbs. The total cylinder volume on each side (neglecting the displacement of the piston rod) is 9.2 cu. ft.

Heating surface, fire-box.....165 sq. ft.  
Heating surface, tubes.....2718.9 sq. ft.  
Heating surface, total.....2883.9 sq. ft.  
Grate area.....45.9 sq. ft.

#### Wheels and Journals.

Drivers, number.....4  
Drivers, diameter.....79 in.  
Drivers, material of centers.....Cast steel  
Truck wheels, diameter.....36 in.



Atlantic-Type Locomotive for the Norfolk & Western.

the last ton possible, because they cannot make the required time; so a little too much momentum grade introduced will not cause stalling, and if not as much as was possible were used, some returns are obtained, for the extra construction expense, in the running time saved.

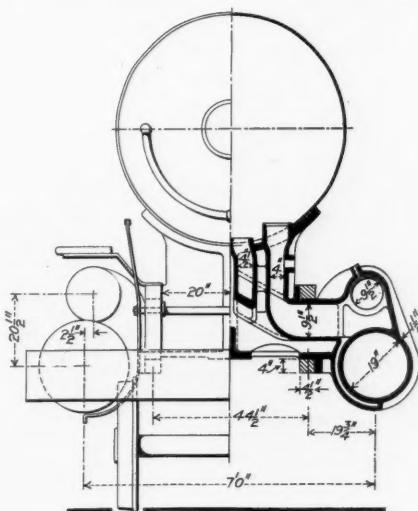
The custom, on eastern railroads, of sticking to an assumed maximum grade rate, regardless of cost, stations or speed possibilities, gives a line of higher first cost and generally of a lower operating value, because of the high ruling grade at stations. Momentum grades, based on the assumption that the locomotive exerts the same tractive power at all speeds, will lead to serious error. Somewhere between these extremes is the proper use of momentum, where the greatest liberty is taken with the grade rate to make it fit the ground, limited only by the ability to join with proper vertical curves and the capacity of the locomotive plus momentum to make the required speed. Engineers who look on the percentage of rate of grade as the end and object of a railroad have mistaken the measure for the thing itself. A grade should be limited, not to a maximum rate, but to the locomotive power, and the momentum then made to fit the ground. The mere rate of grade is irrelevant and often misleading.

#### Atlantic-Type Locomotive for the Norfolk & Western.

Six new Atlantic-type locomotives are now being built by the Baldwin Locomotive Works for the Norfolk & Western. They are to replace some American-type locomotives that do not quite bring the trains up to the desired high speed service. The engines are booked for February delivery and were designed under the direction of Mr. W. H. Lewis, Superintendent of Motive Power, by Mr. J. A. Pilcher, Mechanical Engineer.

The total weight in working order is 163,000 lbs., with 84,000 lbs. on the drivers. The total heating surface is 2,884 sq. ft. and the cylinders are 19 in. x 28 in. The grate has an area of 45.9 sq. ft. and is designed to burn bituminous coal. The drivers are 79 in. in diameter.

We have heard that considerable trouble has been ex-



Norfolk & Western Locomotive.

Some of the typical ratios are as follows:

Weight on drivers divided by maximum tractive effort.....	3.8
Weight on drivers divided by heating surface.....	29.1
Total weight divided by heating surface.....	56.5
Heating surface divided by grate area.....	62.7
Tube surface divided by fire-box heating surface.....	17.1
Heating surface divided by cylinder volume.....	314
Grate area divided by cylinder volume.....	5.0

From the above list of ratios it will be seen that the design should be well adapted to high speed service. The ratio between weight on drivers and heating surface is quite low and hence the steaming capacity of this engine should be high.

Trailing wheels, diameter.....50 in.  
Journals, driving axle, size.....8 1/2 x 10 1/2 in.  
Journals, truck axle, size.....5 1/2 x 10 in.  
Journals, trailing, size.....8 1/2 x 10 1/2 in.

#### Cylinders.

Cylinders, diameter.....19 in.  
Piston, stroke.....28 in.  
Piston rod, diameter.....3 1/4 in.  
Main rod, length center to center.....11 ft. 3/4 in.  
Steam ports, width.....1 1/2 in.  
Exhaust ports, width.....2 1/2 in.  
Bridge, width.....1 1/2 in.

#### Valves.

Kind of.....Balanced piston  
Diameter.....9 1/2 in.  
Greatest travel.....6 1/2 in.  
Steam lap.....1 1/2 in.

#### Boiler.

Boiler, type of.....Radial stay, wagon top  
Boiler, working steam pressure.....200 lbs.  
Boiler, thickness of material in barrel.....5/8 and 1 1/16 in.  
Boiler, diameter of barrel.....62 in.

#### Fire-box.

Fire-box, length.....8 ft. 3 15/16 in.  
Fire-box, width.....5 ft. 4 1/4 in.  
Fire-box, depth front.....6 ft. 1 1/2 in.  
Fire-box, depth back.....5 ft. 1 1/2 in.  
Fire-box, thickness of sheets.....5/8 in. and 1/2 in.  
Firebox, water space, width:  
Front, 4 in.; sides, 3 1/2 in.; back, 4 in.

#### Tubes.

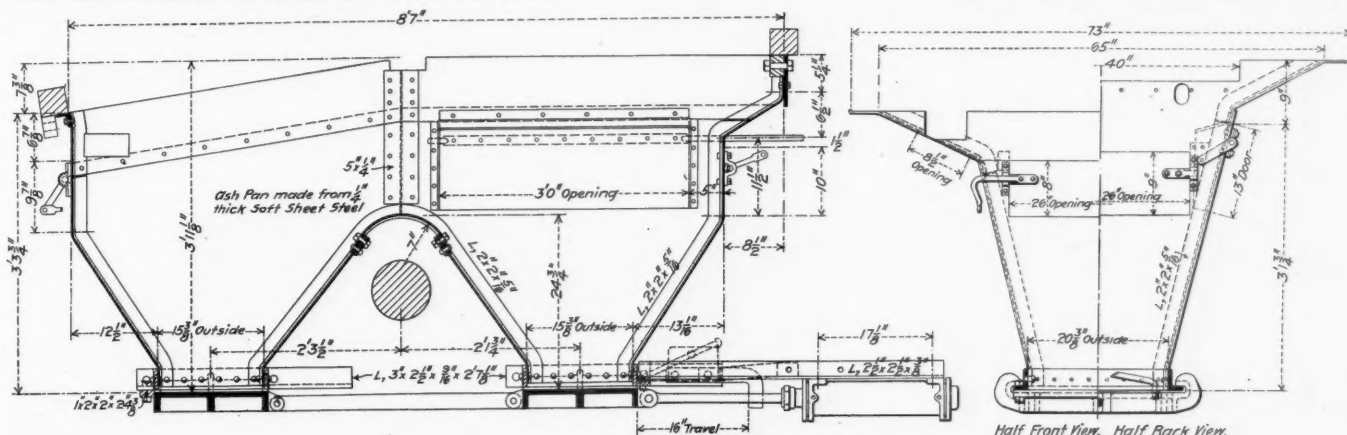
Tubes, number.....326  
Tubes, outside diameter.....2 in.  
Tubes, length over sheets.....16 ft.

#### Tender.

Type.....8-wheel  
Tank capacity for water.....6,000 gal.  
Coal capacity.....10 tons  
Type of underframe, wood or iron.....10-in. channels  
Type of truck.....Barber  
Diameter of truck wheels.....33 in.  
Diameter and length of axle journals.....5 1/4 x 9 in.

#### Imports and Exports During 1902.

The advance sheets of the Summary of Commerce and Finance, published by the Treasury Department, give the total value of iron and steel imports during the year, not including ore, as \$41,468,826, which is more than double the figure for 1901, when the iron and steel imports were valued at \$20,395,015. Steel and iron bars



Details of Ash Pan.

A general description follows:

Type.....	Atlantic
Kind of fuel to be used.....	Bituminous
Weight on drivers (estimated).....	84,000 lbs.
Weight on truck wheels (estimated).....	38,000 lbs.
Weight on trailing wheels (estimated).....	41,000 lbs.
Weight, total.....	163,000 lbs.
Weight tender loaded.....	110,000 lbs.

#### General Dimensions.

Wheel base, total, of engine.....	28 ft. 8 1/4 in.
Wheel base, driving.....	6 ft. 10 in.
Wheel base, total (engine and tender).....	53 ft. 9 1/16 in.
Height, center of boiler above rails.....	9 ft.
Height of stack above rails.....	15 ft. 5 1/2 in.

perienced with the frames of Atlantic type locomotives by breaking between the cylinders and drivers. In this design the frame is double, one bar passing above the saddle casting and the other bar passing below the casting. The cross section of the frame at this point is 4 in. x 4 1/2 in.

The valve-rod has a back support and the rod connecting the link and rocker arm is bent so as to pass beneath the leading driving axle. The piston valve is 9 1/2 in. in diameter.

Other details of novel design are the equalizer bar

for railroad use (including rails) totalled 63,522 tons, valued at \$1,576,679, as against 1,905 tons, at \$67,052, imported in 1901, and an amount still smaller in 1900.

The value of breadstuffs exported during 1902 was \$195,717,728, as against \$276,404,299 in 1901, and \$250,786,080 in 1900. Exports of cars and parts of cars for use on steam railroads amounted to \$2,699,185, as against \$3,956,498 in 1901. Cotton was exported to the value of \$33,274,907, as against \$26,042,755 in 1901, and \$20,722,759 in 1900. The total exports of iron and steel and manufactures of the same amounted only to 67,455 tons,

with an aggregate value of \$1,902,396, as against 318,055 tons, valued at \$8,628,781, in 1901, and 356,245 tons, at \$10,885,416, in 1900. The average price per ton figures to \$28.20, as compared with \$27.12, in 1901, and \$30.58, in 1900. Three hundred and sixty-eight locomotives were exported, as against 448 in 1901. The average price was \$10,777 each, comparing with \$9,043 in 1901, and \$10,249 in 1900. It is interesting to note that Canada and Mexico were each supplied with 112 locomotives, and that Japan, with 32, was the next best customer. Forty-five, in all, went to South America, however. None were exported to the United Kingdom, France or Germany during the past year.

#### Low-Pressure Pneumatic Interlocking at Albany.

The illustration, Fig. 1, given herewith, shows the cabin and air reservoir of the interlocking plant lately put in for the Delaware & Hudson at Livingston avenue, Albany, N. Y., by the Pneumatic Signal Company of Troy, N. Y.; and the diagram, Fig. 2, shows the arrangement of the tracks and signals. These tracks were shown on the sheet published several weeks ago, describing the signaling on the New York Central at this point, but the diagram did not explain that two different kinds of apparatus were used, made by different companies. The machine in the D. & H. cabin, low-pressure, has 25 working levers and seven spare spaces, and the levers work six switches, two sets of double slips and 24 signals. One of the levers works four signals, through a selector; and six others work two signals each, through two-way selectors. One signal is 725 ft. from the cabin and the distance to one switch is 675 ft.

Fig. 2 shows the low-pressure pneumatic machine in the New York Central cabin at Niagara Falls. This view is given for the purpose of showing the appearance of the machine when enclosed. All photographs heretofore published have shown machines without covers.

#### Abolition of Grade Crossings in Massachusetts.\*

Massachusetts, in 1869, had one mile of railroad to 5.47 square miles of territory. The Railroad Commission was established in that year, and at once began to consider the question of the dangers at grade crossings. Since 1882 few new crossings have been made at grade, the law forbidding such crossings except by consent of the Railroad Commissioners. In some cases, however, the Legislature has overruled the commission. In 1873 the number of crossings per mile of railroad was 1.34. In 1880 it was 1.32, ten years later 1.07, and in 1900 it was .97. In 1880 25 per cent. of the crossings were guarded, in 1890 42 per cent., and in 1902 56 per cent.; but this increase in protection has not prevented an increase in the number of accidents at crossings, the number of persons killed in 1894 being 19, in 1900 24, and in 1902 25. A gate or a watchman provides a warning, but a heedless or headstrong person may disregard it. Much of the travel along railroad tracks is invited by the frequent grade crossings, pedestrians taking the track from one crossing to another. In 1888 the Legislature authorized the Governor to appoint a special commission of three civil engineers, A. W. Locke, W. O. Webber and George A. Kimball, who made a report in 1889, setting forth the grade crossing problem of the whole State. They found 2,267 highways crossing railroads at grade, and estimated that to abolish these crossings (except 20 of the worst ones) would cost \$40,766,000. Five years before this, the Railroad Commissioners had estimated that it would cost 100 millions to abolish the crossings in the cities and large towns (omitting the country crossings), and Mr. Turner thinks that this is nearer the actual cost than the estimate of the Board of Engineers.

This special board believed it impracticable to fix in advance the proportion of expense to be paid by the several parties, and each special commission now decides in the case of each application for an over or under crossing what the proportions shall be; but Mr. Turner speaks throughout his paper as though the proportions were fixed by law. As a matter of fact, the law does impose certain limits so that in nearly every case the town is ordered to pay 10 per cent., the city 25 per cent. and the railroad 65 per cent. (The reader of the *Railroad Gazette* is familiar with the general features of the law of 1890; the State appropriating five millions of dollars, to be spent in 10 years, and the State's appropriation is practically limited to 25 per cent. of the cost in each case).

"Regarding the practical working of the Act of 1890, everything has been as favorable as could be expected. At first the number of applications was small, and it was necessary to pass other acts amending and perfecting the details. Some railroad companies have taken the initiative, applying for the abolition of many grade crossings on their lines. Others have waited for the cities and towns to take action, meeting them fairly and helping on the movement. In a very few cases have the companies done anything to prevent action."

The special commission appointed in each case by the Superior Court has usually consisted of a lawyer, a civil

\*Abstract of a historical sketch, by Edmund K. Turner, read before the Boston Society of Civil Engineers, Oct. 22, 1902, and printed in the *Journal of the Association of Engineering Societies*, November, 1902. Mr. Turner has acted both as engineer and as special commissioner in a number of the crossing changes which have been made under the Massachusetts law of 1890.

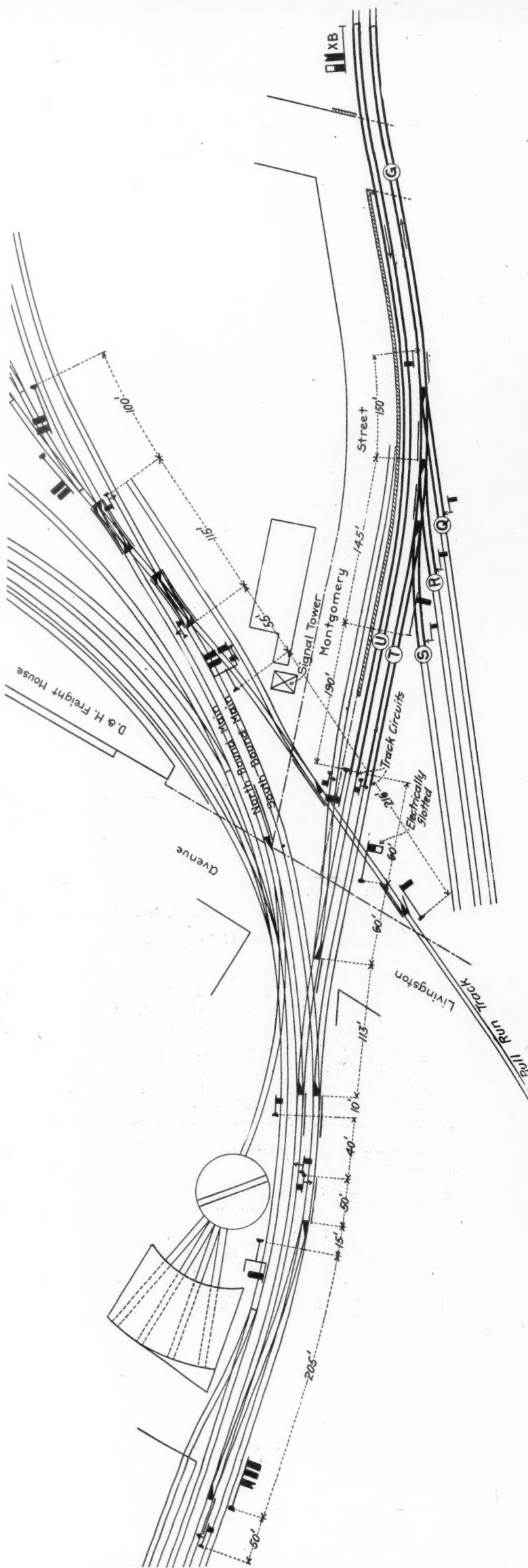


Fig. 3.—Tracks of the Delaware & Hudson Railroad at Livingston Avenue, Albany—Low-Pressure Pneumatic Switch and Signal Apparatus—Junction with the New York Central.



engineer and one other person. If a commission decides that a crossing should not be changed, that ends the matter, though in one case of this kind the Legislature afterward passed a mandatory act. A commission has power to change highways, to order new ones built, to order land to be taken, etc., and, with the consent of the Railroad Commissioners may change the grade of a railroad. Usually the railroad company is ordered to do the work and collect the proper proportions from the town and State. Each commission fixes its own compensation, subject to the approval of the court. Mr. Turner thinks that a special commission is the most suitable authority to deal with a question of this kind;



Fig. 1.—Signal Cabin at Livingston Avenue, Albany—Delaware & Hudson Railroad.

the results have probably been much better than would have been reached if one fixed commission had been constituted to hear and decide all cases arising under the law.

"By the provisions of Section 6 of the law, the Legislature established a principle for determining the manner in which the public ways and structures as altered shall afterward be maintained. If the way crosses the railroad by an overhead bridge, the framework of the bridge and its abutments shall be maintained and kept in repair by the railroad company, and the surface of the bridge and its approaches shall be maintained and kept in repair by the town or city in which the same is situated. When the public way passes under the railroad, the bridge and abutments shall be maintained and kept in repair by the railroad company, and the public way and its approaches shall be maintained and kept in repair by the town or city in which they are situated. This division of responsibility and cost of maintenance is on natural lines, and to each party is assigned that portion which it can best inspect or observe and for which it is best prepared to furnish material and do the work of maintenance."

The law has been amended a number of times. At present, the State pays the share apportioned to the town and gets the money back in installments.

In 1892 a special law was passed for the extensive work on the Boston & Providence, at Boston, and the city and State together paid 45 per cent.; at Chelsea, in 1902, a street railroad company was made to pay 5 per cent. and the State and cities paid 30 per cent. At Northampton the commission was empowered to decide also as to the building of a costly new station and freight yard. Between Hyde Park and Dedham, in 1896, the cities and towns paid 15 per cent., and the State 30.

Within the past three or four years the dangers of electric railroad crossings have largely increased, and there is a demand that they shall pay part of the expense of abolishing grade crossings. It has been found very difficult to divide these expenses fairly. A number of street railroads using private rights of way have to cross streets, thus making a crossing nearly as bad as

a standard railroad crossing. In some recent locations this danger has been recognized and the company has carried its track above or beneath the highway. One year ago there were 312 crossings in the State, of street railroads and standard railroads, at grade, though some of the standard railroads were not main tracks.

The total number of crossings abolished up to 1902 has been 243. The five million dollar fund was exhausted in 1901, and a new appropriation of five millions for the future has been made. The total of the expenditures under the act of 1890 [not including the special acts like that in the Dedham case] has been about 12 millions.

By a law of June 4, 1902, a street railroad may now petition for a separation of grades. The law says that the commission shall not assess on the street railroad more than 15 per cent.; and what the street railroad does pay is to relieve the State; the railroad and the city pay the same as before. This law also requires a certificate from the Board of Railroad Commissioners in each case to the effect that the proposed change is reasonable and necessary, that the distribution of the expense is fair and that the demands on the State treasury will not exceed the amount provided under the appropriation.

"The work of abolishing grade crossings in this State has proceeded in a manner which promises to remove, within a few years, a large proportion of those most dangerous to public travel. The large expense involved has made it necessary to move with some degree of deliberation. The interests of both taxpayer and stockholder require that care be used to avoid undue expense in carrying out the work. The decreased number of casualties at crossings already shows that the work done is producing the results hoped for."

#### DISCUSSION.

The discussion following the reading of the paper was participated in by Messrs. John W. Ellis, J. W. Rollins, Jr., George F. Swain, William F. Williams, Robert R. Evans, C. Frank Allen, Henry Manley and I. M. Story. Mr. Ellis was inclined to think that a continuous commission would be better and also that there ought to be more latitude in apportioning the expense. Mr. Rollins had found the law defective in that owners of abutting lands are not notified so that they can protect their interests where the course of a highway is changed. A landowner must inform himself and, if he wishes to protest, must act within a year, and until work is begun he may be in ignorance of what is going on. Railroad engineers have troubles of their own and changes in streets and sewers ought to be supervised by the city engineers. Sometimes, however, a city or town would not do a job as economically as it would be done by the railroad.

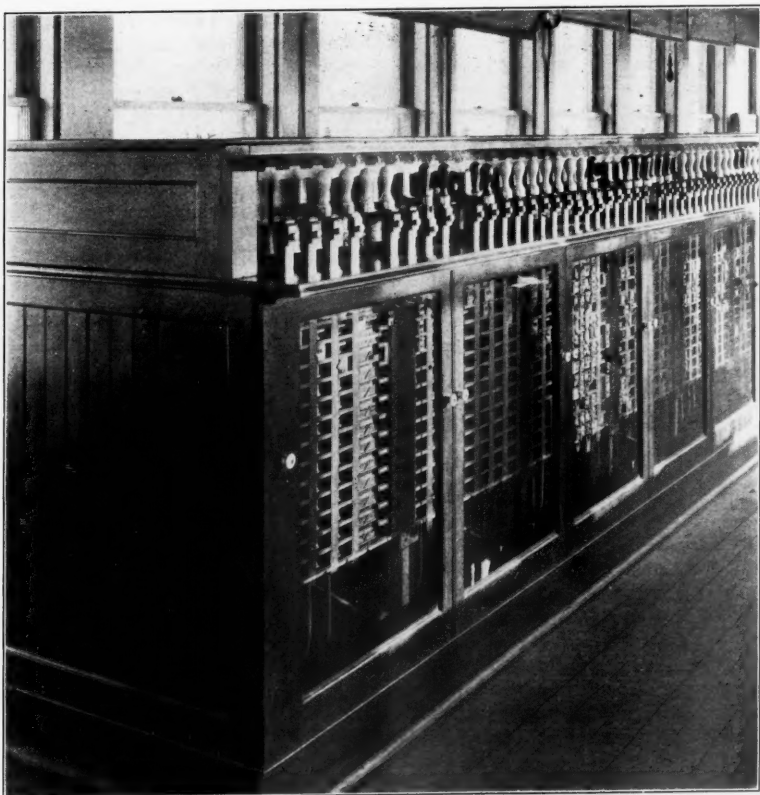


Fig. 2.—Low-Pressure Pneumatic Interlocking Machine at Niagara Falls—The Pneumatic Signal Co.

Some of the towns have been willing to approve extravagant schemes because the amount charged against them was so small and did not have to be paid at once; so that many changes have cost several times the sum first estimated. Towns want stone arch bridges because they look better than metal bridges. This demand is made wholly on account of æsthetic reasons; but the speaker believed stone arches to be really cheaper and better than steel.

Professor Swain thought that the proportions in a number of cases ought to have been varied from the stereotyped 65, 25 and 10, but, after all, freedom to do this would have introduced a new element of uncertainty. Mr. Williams told how a commission was appointed at

New Bedford eight years ago, which has not yet reported. The law ought to be amended so that a railroad company could not thus delay action desired by a city. A commission should first decide on the general plan and then say when it should be carried out. This is desirable even if delay is necessary, so that citizens can know what to expect.

Mr. Evans defended those cities which have permitted elaborate improvements because 90 per cent. of the cost was paid by other interests. A city is bound to consider the future and to jealously protect the æsthetic interests of the citizens when an important public improvement is to be made. Professor Allen called attention to the fact that the State does not have a representative at hearings; the towns and the railroads, acting together, can do as they please. Lately, however, the auditor appointed by the court has taken more interest in behalf of the State. He commended Mr. Turner's paper as a valuable summary of facts which otherwise would be hard to find. Mr. Manley regretted that Mr. Turner considered chiefly legal and financial points and left the engineering phase of the subject untouched. Between Boston and Forest Hills the Providence road has elevated its track, while in Newton the Boston & Albany had taken the opposite course. In one case there is an unsightly dyke through the city, whereas in the other the railroad is out of sight and the landscape is improved. Each special commission ought to consider the whole broad subject of the future relations of the railroad to all highways within a reasonable distance.

Mr. Story said that hereafter the Attorney-General would probably take more care to look out for the interests of the State.

Mr. W. O. Webber (contributing by letter) said "From an engineering point of view it is always cheaper to raise a railroad than to depress it. A railroad can in almost every case be raised without interruption of traffic over its lines. On the contrary, if a railroad is to be lowered, it is almost impracticable to do so without stopping traffic or building a detour around the entire location during the period of depressing the tracks. It has been found that railroads require less change of grade when elevated than when depressed; consequently, the cost is less." Many factories would be just as well off with a spur track entering their buildings on the level of the second floor. The æsthetic argument can readily be met, for viaducts and even steel bridges may be made ornamental and objects of pride. The people can afford to climb up occasionally to the elevated steam railroad station, when they make their long journeys, for the sake of having the electric cars, for their more frequent journeys, at a convenient grade. As for new railroads, either steam or electric, they need not cost more without grade crossings than with them. There should be a permanent grade crossing commission because the subject requires long, comprehensive, and far-reaching study.

#### Organization of the International Mercantile Marine.

The details of the organization of the shipping combination were completed Jan. 30. Clement A. Griscom is President of the International Mercantile Marine Co.; Sir Clinton E. Dawkins, K. C. B., Vice-President in Great Britain; Philip A. S. Franklin, Vice-President in America; James S. Swartz, Treasurer; J. F. Fahnestock, Jr., Assistant Treasurer; E. E. Parvin, Secretary; J. J. Hope, Assistant Secretary; R. E. Griscom, Assistant to the President and Manager of the insurance department; M. W. Tingley, Comptroller, and F. L. Stetson, General Counsel. The White Star, American, and other lines of which the combination is made up will retain independent organizations for conducting business, and it is not proposed to make any striking changes in the management of these subsidiary companies. The management recognizes that the familiar names and flags are assets of considerable value, and that consolidations which destroyed the identity of the properties would result in a loss of business. The only immediate change contemplated in New York is the abandonment of the Leyland office and a transfer of the Leyland New York business to the White Star office. The main economies which the consolidation is designed to effect will occur from a regulated central control of the tonnage, rather than from reduction in offices and office personnel.

#### Disastrous Butting Collision at Vail, Arizona.

Press despatches of Jan. 28, reported on a butting collision on the Southern Pacific at Vail, Ariz., 20 miles east of Tucson, in which 24 persons were killed and 30 or more were injured. The collision was between east-bound and west-bound passenger trains, and both trains were running at full speed. The wreck took fire and many of the passengers were burned to death. All of the cars of both trains, except five sleeping cars, were also burnt up. A statement published as authorized by an officer of the road says: Telegrams we have received say that the collision took place before daylight this morning, and that it was caused by the negligence of the telegraph operator at Esmond, a station 14 miles east of Tucson. The westbound train, the Sunset Limited, was two hours late, and was traveling on the time of another train. The eastbound train was the Crescent City Express. The operator at Esmond should have stopped the westbound train and delivered orders to it.





ESTABLISHED IN APRIL, 1856.  
PUBLISHED EVERY FRIDAY  
At 32 Park Place, New York.

#### EDITORIAL ANNOUNCEMENTS.

**CONTRIBUTIONS.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**ADVERTISEMENTS.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and these only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.

The Pennsylvania has taken off its 20-hour special between New York and Chicago because it interfered with freight traffic. Given a clear right of way, there was no specific difficulty in running the train between Chicago and New York in 20 hours, but with miles of freight trains waiting their chance; with chartered ships eating their heads off at the docks while their grain, 1,000 miles west, was under embargo, the cost to the community was too great. The actual service rendered by extreme speed in passenger traffic need not be discussed at this time. Whether, in the last analysis, anybody is going to be richer because he can travel from New York to Chicago in 20 hours instead of 24, is a question worth a little thought, but it does not affect the present situation. Until the steel and coal and coke and grain that now stretch in a pretty much unbroken line from New York to Pittsburgh and Chicago can reach their destinations, their importance, as affecting their right of way, is all out of proportion to that of fast passenger trains, and if it becomes necessary to sacrifice more of the latter, the sacrifice is justified. The withdrawal of the special, under existing competitive conditions, is also a good example of moral courage. If all the railroads between the Mississippi and the Atlantic could agree to cut down their passenger train speeds twenty-five per cent., more or less, for the next three months they would do the country a great service. That would probably clean up the freight situation—for the time.

When the Finance Committee of the United States Steel Corporation announced its remarkable plan for stock distribution and profit-sharing\* almost the first question that arose in the mind of anyone who considered it was as to the number of men in the lower classes who would subscribe. It will be remembered that in this plan the 168,000 officers and employees are divided into six classes. Class E, those who are paid from \$800 to \$2,500 a year, and Class F, those who are paid \$800 a year or less, number something over 166,000. While we all expected that Classes A to E, inclusive, would take all of the preferred stock that they could get on the terms at which it was offered, we did not look for a large subscription in Class F. The reasons for this we need not dwell upon. They are obvious and familiar. The results of this first offering are now announced officially, as follows:

"The books for subscription to stock closed on Saturday evening, Jan. 31, and the stock was subscribed for as follows: 27,633 men subscribed for 51,125 shares. Class E, composed of men who receive salaries of \$800 to \$2,500 a year, subscribed for 29,013 shares—14,600 men subscribing. Class F, which is composed of men who receive \$800 or less in wages, subscribed for 15,038 shares—12,170 men subscribing. The board of directors voted to allot to Class F all

the stock they subscribed for, and to Class E, 90 per cent.; Class D, 80 per cent.; Class C, 70 per cent.; Class B, 60 per cent., and Class A, 50 per cent. of the stock for which these respective classes subscribed."

It will be seen that Classes E and F alone will take 41,000 shares of stock. The allotment to the other classes is not made known, but the total allotment cannot be much short of 45,000 shares. The amount originally bought for this distribution was 25,000 shares. No doubt the additional stock is provided for; at any rate, it would not be a bad investment for the directors to buy the extra 20,000 shares at the market price and distribute it at the subscription price. They would lose five dollars a share, but they would get a great deal of value for their \$100,000.

#### Nickel-Steel Rails.

We are told on good authority that the Carnegie Steel Company has orders for 9,000 tons of nickel-steel rails. The Pennsylvania Railroad is to get 5,000 tons of these; the Pennsylvania Lines West of Pittsburgh are to get 3,000 tons, and the Baltimore & Ohio is to receive 1,000 tons. The angle splices for these rails are also to be made of nickel-steel. The rails will be made of the usual Bessemer, high-carbon steel with  $3\frac{1}{2}$  per cent. of nickel added, and the splice bars will be of the usual grade of mild steel with  $3\frac{1}{2}$  per cent. of nickel. The Edgar Thomson Works have already finished 2,500 tons of the order, and it is reported that no difficulty has been experienced in rolling the rails. The cost of drilling these rails is naturally much greater than with the usual material, as is the time required, due to the greater hardness and toughness of the nickel-steel. The cost of the new rails is estimated at about twice that of the high-carbon rails, but it is expected that they will last three or four times longer. The present intention is to use these rails only in sharp curves. Part of the order will consist of 85 lb. sections and the remainder of 100 lb. sections, the exact number of each not having been definitely decided.

Readers of the *Railroad Gazette* will remember that about five years ago the Pennsylvania Company laid 50 tons of nickel-steel rails on a four-degree curve near New Salisbury, on the Cleveland & Pittsburgh Division, and in June, 1899, the Pennsylvania Railroad placed an order for 300 tons of nickel-steel rails with the Carnegie Company. These latter were laid in the westbound track on the heavy grade and curve above Altoona. The order which has lately been given is said to be the outcome of these experiments, so that we may conclude that they were at least encouraging.

It is interesting and perhaps important to note that a large part of the first nickel-steel rails rolled by the Carnegie Company were thrown out in the mill, by the makers; but the difficulties of manufacture seem to have been overcome, perhaps by the lower temperature at which the rails are now finished.

We have long held that it is illogical to use mild steel splice bars and high-carbon steel rails. The hard rail cuts into the soft splice and when wear begins, it goes on increasing in geometrical ratio. Further, a high-carbon splice, with a high elastic limit, will make a stiffer joint, weight for weight, than a mild steel splice. We are quite aware of the reason for making splice bars of low steel, but it cannot prevail long now.

During the earlier experiments with nickel-steel rails, it has sometimes been claimed that the adhesion of the driving wheels was materially decreased, but we have heard no proof that such was the case. No doubt the hard surface of the nickel-steel rails soon becomes highly polished, but we can scarcely believe that the coefficient of friction is greatly reduced, especially when sand is used. On the other hand, the rolling friction of the train should theoretically bear some inverse ratio to the hardness of the rail. If such is the case, the nickel-steel rail will contribute to decrease train resistance and offset any loss of tractive adhesion.

#### The Westfield Collision.

To the reader of the *Railroad Gazette* there is little new to be said about rear collisions. The remarkable case reported in this and the last issue brings up a number of important questions, but the principles which should govern their solution have been well understood for years, and our views concerning them are already known. Moreover, in consequence of the overwhelming sadness and anxiety in the public mind, resulting from a disaster of this kind, so many branches of the subject are discussed that nothing short of a ten-page report can deal with the great variety of questions that people want to have argued. In an editorial article therefore, we shall

only undertake to touch, by a paragraph or two, on each of the four points of most immediate interest. These points are (1) the automatic stop; (2) the additional man in the cab; (3) permissive block signaling, as compared with absolute, and, (4) pressure of traffic, leading trainmen to take chances.

The question of an automatic stop appears to be the one most attractive to the American mind. The methods of stopping a train in spite of a heedless engineman are not only easy, but inexpensive—on paper. The newspapers describe the process every few months. An American consular agent in Europe has recently sent to Washington an account of experiments with an apparatus designed for this purpose, and the account has been printed in a thousand newspapers scattered all over the country. The experiments were chiefly with the telephone attachment. By means of an electrical contact between the locomotive and a rail, a signalman, or an engineman of another train a half mile away or any number of miles distant, may signal to an engineman, or may stop his engine without signaling to him. This story evidently appeals to a great majority of editors as the most interesting kind of news. And yet devices essentially of this kind have been regularly patented every year, if not every month, for the last 20 years, and to the railroad officer who is tender hearted enough to listen to inventors, this is the most trite of subjects. Not only have these things been invented and re-invented many times; the Union Switch & Signal Company's earliest catalogue contained a description of one of the simplest devices of the class. The one tried on a few miles of road near Chicago, about ten years ago, possessed nearly or quite all of the elements of success for such a device. There is no question from the mechanic's standpoint that automatic stopping is feasible. The South Side Elevated of Chicago, built in 1892, was equipped with automatic stops, and they underwent a trial of several years, but they have been abandoned, we believe. An automatic stop is now used on the Boston Elevated road, and not long ago a train was stopped by one of the "triggers." A motorman fainted and the apparatus duly performed its function.

In spite of these facts railroad officers remain cautious. All machines thus far devised are liable to omit to give notice of the failure of some of their parts; and as their failure to act is equivalent to a go-ahead signal, a false indication may be given. With automatic stops it is much harder to enforce human vigilance, for the runners will naturally depend on the machine. Vigilance can be tested by using lead or glass seals, which an engineman will break if he disregards a warning; but a high degree of vigilance is required in someone else to keep the seal-system screwed up constantly to real efficiency. A sample of the difficulty of maintaining vigilance was given in a recent paper by Mr. Elliott, signal engineer of the Chicago, Milwaukee & St. Paul. Speaking of electric repeaters in a signal cabin, to inform the signalman that a distant signal, out of sight, was properly working, he said that he had found that after a signal had worked well for a long time the man would omit to look at the repeater.

A careful survey of the signal needs of almost any railroad will show that in the expenditure of a given sum of money, for the purpose of enhancing the safety of passengers and employees, some point other than this needs first attention. The need of automatic stops on a line well equipped with visual signals is not so great as the need for visual signals on lines which now have none. It is found wiser to equip a hundred miles with well-approved visual signals than to add the higher refinements and thereby limit the improvement to 80 miles, or 60, or 50. Without going farther into this question at this time, these points will serve to keep in sight the fact that the reluctance of enterprising railroad officers to adopt new "inventions" is not due to blind ignorance.

(2) The argument in favor of a third man in the cab (or, if it be assumed that the fireman of a Wootton engine cannot be in the cab at all, a second man in the cab) is based chiefly on ocean practice and on the alleged satisfactory results of the rule that on ferryboats there shall always be two men in the pilot house. As the kind of vigilance demanded of the pilot of a ferryboat differs in such important respects from that required of a locomotive runner, it seems scarcely necessary to spend much time in comparing the respective situations. A boat pilot has what most locomotive runners would call an exceedingly easy time. His pilot house is quiet. His view is wide and free, and the number of seconds that his nerves are subject to high tension, as compared with the same condition in the engineman's experience, is as one to a hundred. The captain of the ferryboat,

\**Railroad Gazette*, Jan. 9, p. 26, the circular in full; p. 30, editorial summary and discussion.



going into the pilot house to act as the second lookout man, has nothing else to do. The two men can converse with one another while still keeping an adequate lookout. The question of the lookout in the cab of a locomotive must be considered strictly on its own merits. The first objection to be made by the superintendent will be that the additional man will have nothing to do, except the irksome task of holding himself up, without any natural aids, to the performance of a duty which he is constantly tempted to look upon as entirely useless, because the same duty is being performed by the engineman. The old principle applies, that when B is set to watch A, we immediately find it necessary to engage C to watch B. On locomotives with cabs of the ordinary kind, with the engineman and the fireman so situated as to be able readily to speak to one another, the rule requiring them always thus to speak, on sighting fixed signals, has long been in force on some roads; that is to say, "in force" in the books of regulations; but it is universally agreed that this is one of the hardest in the whole list to get obeyed. This is due to the difficulty of testing men's fidelity when you cannot see them, and to the fact that the fireman is the subordinate of the engineman. He does not like to act as monitor for his boss. It seems clear, therefore, that if we are to have a monitor in the cab he must be the equal of the engineman. As to the wide fire-boxes, with the cab in front, if the fireman is of any use as a monitor in the old-fashioned cab, it would be comparatively easy to make him of equal use, even if he were out of sight and hearing of the cab, for a bell or a rope or some other simple communication could be very cheaply arranged. The first element of the question of a second man in the cab is to find out what the fireman is good for. On many easy runs he can, undoubtedly, perform all the useful functions that a third man could perform. When it is agreed that he is useful as a lookout man on such runs it will be pertinent to discuss the need of a third man on hard ones. There is no agreement on this point as yet, for some superintendents insist that the rule requiring a co-operative lookout is wrong, while others make the rule so elastic that no fireman finds it necessary to obey it, except according to his own fancy.

The difficulty of enforcing a good lookout is illustrated by those cases, which are well known to all railroad officers, of collisions in which three and even four men in a locomotive cab have gone to their deaths in spite of warning signals. In the terrible collision at Mud River, Pa., in 1888, where 66 persons were killed, there was a pilot in the cab with the engineman. In a disastrous collision at Monmouth, Ill., a few years ago, where a passenger train was wrecked, and many passengers injured, by the train running over a misplaced switch, the road foreman of engines was in the cab with the engineman. Not long ago at Hummelstown, Pa., a freight train was derailed at the derailing switch at the approach to a temporary gauntlet over a bridge, and the engineman, fireman and two other trainmen riding in the cab were all killed in the wreck of the engine, although they had warning by a high red light on a semaphore and another red light about 6 ft. above the ground, on the switch stand that worked the derail. A still later instance of this kind will be found in one of our recent monthly records, where a freight train, running perhaps 20 or 25 miles an hour, ran into an open drawbridge and three of the four men on the engine were drowned. This train ran past both a home and a distant signal set against it. The facts that familiarity breeds contempt, and that men will not be uniformly vigilant, even to save their own lives, are among the simplest lessons of railroad experience.

(3) Permissive Blocking comes up for discussion because the sacrifice of a score of passengers' lives at once leads to comparison with the records of England, where for 15 months not a passenger was killed and where permissive blocking with passenger trains is unknown, or, at any rate, is extremely rare. With a signalman at the entrance of every block section, as is universal in England, an engineman encountering a stop signal can stop and wait indefinitely; for the signalman, by means of his telegraph, can learn when the preceding train shall have vacated the block section; but with automatic signals the movement of the preceding train cannot be positively known, and the waiting engineman thinks that perhaps the stop indication is caused by a derangement of apparatus; and so the rules permit him to move cautiously forward. This is permissive blocking. Whether he wait three minutes before going on, or one minute, or one second, or does not wait at all, makes little or no difference with the principle. The question is, Can we let trains pass stop signals and

yet maintain good discipline? With the wire-circuit automatic signals used between New Haven and Springfield a few years ago, this permissive blocking was forbidden, because the presence of two trains in the same section at the same time would cause dangerous derangement of the apparatus; and the rule required a train to wait indefinitely at a stop signal. It could not go on before the signal changed to "clear" unless a flagman first went ahead a half mile or more to assure a clear track. It would not be impossible to apply this rule to automatic signals now. The only trouble would be delays due to derangement of apparatus, to carelessly misplaced switches and to broken rails. The question is whether such delays would be intolerable. The primary reason for the non-adoption of a rule of this kind, and for the non-enforcement of the present rule to wait one minute before passing a stop signal, appears to have been that heavy freight trains were needlessly delayed. They would often lose much time by a stop at places where starting was difficult. With long and heavy trains, following each other frequently, permissive blocking is often deemed necessary for the purpose of avoiding too long a space-interval between trains, which means too long a time interval and congestion in yards. It does not follow, however, that passenger trains should be managed in the same way. If a passenger train is to be run at high speed it should be sufficiently far behind the preceding train to find its distant signals, as well as its home signals, clear; and if it is to do this, there is no advantage in permissive blocking, except perhaps when it is desired to start several fast trains out from a station at short time-intervals.

This question of the despatching of fast trains closely following one another is the crux of the matter, as regards the permissive rule. With 3,000 ft. block sections, and distant signals always 3,000 ft. back, a fast train must be 6,500 ft. behind a preceding fast train, if the engineman is to run with full confidence. In the anxiety of all hands to save time there is a strong temptation to shorten this distance limit. If there is a good view approaching the home signal the distant may be safely passed at considerable speed, even if it be against you. On a long, straight line, as at Westfield, there is often no danger in passing a home signal against you, for the track can be seen to be clear for three or four blocks ahead. But if, in a series of a dozen blocks, a single one is on a curve, with a short view, these advantages on the tangent are neutralized and the engineman ought not to try to avail himself of them; if he does, a slight error in judgment as to speed may get him into trouble on the curve. Even with a tangent of a hundred miles a sudden fog will spoil his scheme for saving time, and the only safe way to run will be to follow the indications of the signals strictly; but here again the force of habit and anxiety to save time will tempt the runner to take some risk. Only by the best discipline, and by the employment of conscientious men, and none others, can these variations from strict practice be indulged in. That is to say, the superintendent must rigidly limit his laxity and the runners must be intelligently willing to have it thus limited.

The rule forbidding permissive blocking and that requiring a full stop of a minute at an automatic stop signal are supposed to facilitate the enforcement of satisfactory discipline. As the one-minute rule is itself more honored in the breach than in the observance on some prominent roads, it is not easy to get at the data necessary to test this theory by the facts of actual practice; but on the Boston & Albany, which has been using automatic signals for 30 years, there is no such rule; and the record of that road for freedom from collisions will doubtless compare favorably with that of any line in the country. This being so, no one can assert dogmatically that the one-minute rule is universally necessary. If the superintendent of the Boston & Albany succeeds in making his enginemen understand "four miles an hour" the same as he himself understands it—instead of stretching the rule to any extent that they may deem safe—it would probably be hard to convince him that he ought to make his enginemen come to a full stop. It is true, of course, that a rule is harder to enforce on a road of many long tangents than on one where taking chances is more dangerous, and also that it is easier to prove that in a certain case a train did not stop, than to prove that it did not slacken speed to some rate which observers cannot precisely estimate; but the essential problem remains one of discipline. The thing to be enforced, if we are to continue permissive blocking, is a rate of speed, wherever a block-section is occupied by a preceding train, so low that the engineman can certainly stop his train within whatever length of track

he can see clear before him. With the very high speeds now common it is necessary that the engineman allow himself some margin over and above the net stopping distance; but it is not easy to formulate a succinct rule on this point; the question has to be left to the engineman's judgment, the same as it would in approaching a station or drawbridge or a slow-board.

(4) Our last point, the question whether we are trying to run more numerous or faster trains than the facilities are calculated for, is the most obscure one of the four, and the hardest to deal with; but, as it seems to us, it is the one which most urgently demands immediate attention. The automatic stop will take money which conservative men think could be better used for other things, and one of its basal principles is looked upon as false. If monitors were employed in the cab, it would be as hard to hold them to their duty as it is to make New York policemen catch burglars. And the third question, that of permissive blocking, is bound up with the fourth. The first defense put forward for the engineman in a case like Westfield is that if he does not make time he is pretty sure to be censured. Merely being called before "the old man," or a vague fear of censure, may have as bad an effect as actual condemnation. At the time of the New York city collision, a year ago, one of the lawyers elicited testimony that an engineman who failed to make time with a passenger train was usually "set back" on to a gravel train. The fact that the man's failure may be due to his inefficiency, rather than to unreasonable demands from his superior, does not alter the influence on his feeling and purpose.

This feeling of the runners, that taking chances is justified, demands careful consideration. The superintendent who answers that the engineman ought to know better, does not satisfy the questioning public. We asked one of the best railroad experts, a man not now connected with any railroad, and one who certainly is not prejudiced in favor of the runners, to tell us his remedy for errors like Engineman Davis's. He thought a moment, and slowly replied that the first point would be to determine whether the men managing the trains were being required to accomplish impossibilities. This expert, with apparently no thought of the interests of the enginemen, diagnosed the case exactly as they do. It is not necessary to assume that fear of censure is always the trouble. If an enterprising and ambitious passenger runner by losing five or ten minutes misses a connection, or "lays out" an important freight train, he regrets the resultant loss as sincerely as does the general passenger agent; and if he subsequently takes a risk to avoid a similar delay, it may very likely be fairer to call it an error of judgment than a piece of ignorant recklessness; and on the superintendent and the road foreman of engines rests the duty of educating his judgment up to a better standard.

As we have seen in considering permissive blocking, the education of an engineman's judgment is not an easy task; but in such education lies the most definite hope of reducing our record of collision horrors. The most successful educators in this line have been those who, by strict and just discipline, have induced the men to educate themselves. It is important to select men of high perceptive faculties and of good moral character; and in what we are now saying we do not modify what we have said in the past of the need of more and better lectures and catechising. Strict discipline is futile for the accomplishment of the purpose in hand if the men do not understand what they are being disciplined for. But uniform and persistent compelling of obedience to the smallest rules not only aids powerfully in educating the men's judgment, but brings to a head the other issue; the issue whether the engineman or the boss is to blame when a train is delayed by too cautious running. When a runner loses time because he stops to tighten a joint in the injector, he should have no more hesitancy in reporting the facts to the superintendent than in speaking about them to a fellow runner. If the runner ought to have fixed the fault without stopping his train, he must be told how. If you have given him good advice before, but without effect, how is it that you have such a dull man in that place? If the stop was necessary, the rule forbidding the engineman to take risks is responsible; this is what we mean when we speak of the boss being to blame. In speaking of the desirableness of this perfect freedom of communication between the engineman and his boss we shall be accused of cherishing a "d—d barren idealism"; but in what other way, we should like to ask, do men accomplish satisfactory results in such important and delicate matters as this?



To enforce strict discipline it is absolutely necessary to employ watchers constantly; but strict discipline is the only remedy. If a runner knows that taking chances will involve a 30-day "mark" or suspension he will develop the courage necessary to lose 5 minutes' time and to go into the office and defend his action. The Harlem River drawbridge at 134th street, New York city, is one of the busiest drawbridges in the country, and it has been crossed probably by as many trains as any other drawbridge, for it is one of the oldest; but it was stated by an officer of the road not long ago that no engineman had disregarded the signal there for 25 years or more. It is not merely that engines have not dropped into the river; they have not passed the signals. Are we to admit that we can maintain such discipline there but that it is impossible with block signals on a prairie? Such an admission will be entirely illogical until the attempt has been made and failed. After a failure of good discipline with present appliances we may consider the introduction of the "moral safeguard" of a derailing switch or diverging track at every block signal. Until the adoption by railroads generally of the plan in use on the Chicago & North Western, of making frequent tests and securing absolute knowledge whether enginemen do or do not disregard signals, it will be irrational to claim that our discipline is all right and that Heaven alone is responsible for our death records.

The 20-hour trains of the Pennsylvania road are no longer turned at West Philadelphia, the new tunnel at 40th street having been finished, so that trains can run directly, at full speed, from the New York to the Philadelphia division, and vice versa. With the completion of this tunnel, four other trains are run over this cut-off. These four trains, one westward and three eastward, have heretofore traveled over the Trenton cut-off; so that their journeys are now longer rather than shorter. All of them will pass through West Philadelphia in the night. The plan to utilize this new tunnel cut-off for the purpose of shortening the time of certain through passenger trains which now run to Broad Street Station, appears to have been postponed.

Since we wrote the above the Pennsylvania has announced that the 20-hour trains are to be taken off Feb. 8. The reason given for this announcement is that to run this train regularly at the high speed required by the schedule, necessitates serious detention of freight trains, which, during the present unparalleled congestion of coal and merchandise traffic, entails not only severe loss on the company but great inconvenience to the shippers and receivers of the freight. The reporters have a good deal to say about the unprofitableness of the 20-hour trains. The trains are, of course, costly to run, by reason of their equipment and the high speed; and the income is limited by the extra fare charged. The number of passengers who are willing to pay \$8 extra for a ride to Chicago is in the nature of things very limited. The passenger departments of both the Pennsylvania and of the New York Central have, however, stated repeatedly to the reporters that the 20-hour trains were paying expenses, and they have also stated that the traffic is increasing. It does not seem likely that these statements are wholly manufactured for advertising effect, and any one acquainted with the facts can see that in the present exigency the interests of the traffic as a whole—which means the interests of the whole of the customers of the Pennsylvania Railroad—may demand the withdrawal of such a train, even if there be a considerable profit in running it. One of the newspaper statements has it that for the "Pennsylvania Special" the road is cleared from 50 to 100 miles in advance. Assuming that the train travels at a mile a minute this would mean that other trains were placed on side tracks from 50 to 100 minutes before the time for the fast train to arrive. This seems quite absurd, and is doubtless exaggerated; and yet, it is to be remembered that with the ordinary five-minute or 10-minute clearance rule a train of this kind, on a busy railroad, would very often suffer slight detentions. No freight conductor can calculate to perform a certain operation inside of 10 minutes and invariably accomplish his purpose; and with the enormous difficulties attendant upon the heavy trains, overloaded engines and overloaded cars, and the strain on the repairing forces, the percentage of failures to clear the track on the dot must now be larger than in ordinary times. But even with a clearance rule of 30 minutes a hundred trains would waste 50 hours, and we can well believe that the losses from this cause have been considerable.

On Tuesday last the Senate at Washington passed Mr. Elkins's bill abolishing the imprisonment penalty for making illegal freight rates and making the shipper equally guilty with the railroad and its agents in cases of unjust rates. It is said that there is a considerable sentiment in both houses of Congress in favor of taking definite action on this and the other "anti-trust" measures, and that the House of Representatives will promptly take up the Elkins bill. The bill to establish a Department of Commerce and Labor, the head of which shall be a member of the Cabinet, is also making progress in the conferences of the committees. In this bill

there was a clause changing the status of the Interstate Commerce Commission, but this provision seems destined to be cut out. The correspondents say that three measures, the prohibition of rebates on transportation charges, the expedition of anti-trust suits in the courts and the publicity features which will be the outgrowth of the conference on the Department of Commerce bill, will, in the opinion of influential Senators, constitute the sum of trust legislation at this session. There appears also to be considerable activity in Congress in connection with the proposed amendment to the Safety Appliance law. It will be remembered that the Interstate Commerce Commission, in its recent annual report, suggested the desirability of enforcing by law the use of a larger number of air-braked cars in freight trains. This proposition is embodied in an Act which has been passed by the Senate and is now on the calendar of the House, but there appears to be a lively contest on the subject before the committee members, between representatives of prominent railroad companies and those of the employees' brotherhoods. The brotherhoods demand that in every train the air-brakes shall be in operation on a large percentage of the cars, 75, we believe, while the Interstate Commerce Commission appears to be satisfied with 50 per cent., with certain provisos for subsequently changing the percentage. But the railroad companies are now objecting to a law fixing the percentage as high as 50. The contest appears to hinge on the mandatory features of the bill. It is obvious that the railroad companies, which have spent hundreds of thousands of dollars in equipping their freight cars with air-brakes, intend to utilize that investment as fully as possible by putting these brakes in service; but to lay down a rigid rule that a certain high percentage of air-brake power shall invariably be effective on every train, under a severe penalty for non-compliance, is quite a different thing.

The congestion of freight traffic on the Pennsylvania Railroad East of Pittsburgh, and on that and many other lines (apparently all of the east and west lines) west of Buffalo and Pittsburgh, continues as severe as ever. As noted under another head, the Pennsylvania has taken off its fastest passenger train in order to facilitate the movement of freight trains. An order has been issued to assort empty westbound coal cars at other places, so as to relieve the pressure on the yard at Harrisburg; and in distributing cars to the coal mines and coke ovens west of Altoona, less pains will be taken to assort cars according to their ownership. All cars, except those belonging to the shipper in whose yard the cars are being placed, will be treated as of the same class, even if, in consequence of this, the cars are sent away from home. Some of the difficulties in handling freight at the present time are illustrated by the embargo notice issued by a road west of Chicago last week and published in the newspapers. This notice, issued by a western road in consequence of notices received from eastern lines, contains these paragraphs:

Until further notice we decline to accept shipments as follows: All carload freight, except live stock, company material or supplies, perishable freight or freight loaded within switching limits at Chicago, destined east of Versailles, Moundsville, and Parkersburg. Loaded cars for switching service within Chicago terminal district, with the exception of coal, coke, oil, and perishable freight. All freight, except live stock or perishable, destined to points reached via Wabash Railroad Line, Windsor to Buffalo. All freight, except live stock or perishable, destined Canadian Pacific Railway via Wabash Railroad and Detroit. All freight, except live stock, perishable, or bituminous coal, destined east via Nickel Plate. All freight, except live stock, perishable, or coal, destined to points on Grand Trunk Railway. Grain, hay, lumber and ore destined to points west of Pittsburgh. Grain destined to points on or reached via Erie Railroad. Grain and flour products destined east via Niagara frontier, routed via Milwaukee and Grand Trunk Railways across lake line.

#### The New Grand Central Station.

In connection with the extensive changes of the Park avenue terminal, which are under consideration, the New York Central has submitted plans to the Board of Estimate and Apportionment for a new station building. The proposed structure will be from 16 to 20 stories high, and will contain a hotel. It is also thought possible that a department store, and perhaps also a theatre, will be included under the same roof. The committee of the Board of Estimate reports as follows on this subject, and also with reference to a special approach from Madison avenue:

"The railroad company thinks it possible that, in the reconstruction and enlargement of the depot, it may wish to erect a building not entirely devoted to railroad purposes; such as a hotel above the station. Inasmuch as the company owns the land, your committee sees no reason why this should not be done by the New York Central Railroad, as well as by the Pennsylvania Railroad, and it has, therefore, assented to a clause in the proposed bill which will make such a building possible."

"The railroad company has also under consideration plans for a fine approach to the depot from the Madison avenue side, which may involve making use of the vacant land that it owns between Forty-third and Forty-fifth streets. Neither of these plans have proceeded far enough to be embodied in detail in the pending bill. It has seemed wise, therefore, to ask from the city power to permit any changes to be made in this territory that may be approved by the Board of Estimate and Apportionment. Naturally, no new plans will be approved without public hearings and careful consideration by this board."

The committee, on Feb. 3, submitted three bills to the Legislature as approved by the city, to cover the changes to be made in the Park avenue tunnel, and the removal of grade crossings in the Borough of the

Bronx, previously described in the *Railroad Gazette*. The recommendation of the city that Park avenue be continued by a 60-ft. viaduct from Forty-ninth to Forty-fifth street, has been modified by substituting a 50-ft. viaduct from Forty-ninth street to Forty-fifth street. The committee recommends the acceptance of this modification for the reason that a roadway 36 ft. in width is estimated to be wide enough for four vehicles to pass abreast. A 50-ft. viaduct, therefore, will provide such a roadway and leave space for two sidewalks 7 ft. in width. The use of sidewalks upon this viaduct is not likely to be great.

In the original proposal made by the railroad company, an offer was made to prepare a plan for the elimination of grade crossings on the Port Morris branch of the Harlem division in the Bronx. The present report of the committee is on plans actually agreed upon, involving a tunnel under St. Mary's Park instead of an open cut skirting the park. In consideration of this change in the line of the railroad, it is proposed that the city grant to the railroad company the right to tunnel under the park, and that the city buy the old right of way at its stated value of \$60,000 and add it to the park.

The report presents no other changes of note in the improvement plans as previously published. With regard to the method of building the proposed terminal structure, it is not unlikely that it could be done through the organization of a separate building company, which would issue its own securities, derive its profit from the hotel and store earnings, and furnish the railroad company with the desired accommodations without cost to the latter.

#### Mr. Hewitt and Iron and Steel

At the meeting of the Directors of the United States Steel Corporation last Tuesday the following fine and fitting minute was adopted:

Abram Stevens Hewitt was born in Rockland County, N. Y., on July 31, 1822. He died in the city of New York on Jan. 18, 1903. During the long period of his activity, which continued till this year, he was surpassed by no citizen of the republic in the variety and value of his contribution to the astonishing development of its moral and material resources. A student, a publicist and a spokesman for his people in their manifold relations, whether in or out of public office, he attained and held a position both lofty and unique. Chief magistrate of his city and for many years its foremost representative in Congress, his public career and utterances justly commanded attention in this land and in foreign lands as well. But here and now it is proper that special recognition be made of the important relation that he bore to the iron and steel industries of the United States.

From his early manhood Mr. Hewitt was associated by marriage and in business with Peter Cooper, the friend of man, whose philanthropies and affairs engaged and received Mr. Hewitt's sympathetic and active support, and for more than 50 years the firm name of Cooper, Hewitt & Co. has held high place among the active and progressive iron workers of the Atlantic coast. In the rolling and wire mill erected for this business in the city of New York before 1845, anthracite coal was first applied successfully to the puddling of iron. In 1845 was erected at Trenton, N. J., the largest rolling mill in the United States for the manufacture of railroad iron, and here for the first time were rolled wrought iron beams for fireproof buildings. Of these buildings the very first, begun by Peter Cooper in 1854, was that splendid institution in the city of New York "Devoted forever to the Union of Art and Science in their application to the useful purposes of life," known as Cooper Union, to which from its foundation to the day of his death Mr. Hewitt and his family have given without stint their service and their fortune.

As the representative and spokesman of the iron workers of this country, Mr. Hewitt early and often was called before the public. At the outbreak of the Civil War he became the chosen adviser of President Lincoln, with reference to the supply of iron and arms from European sources. In 1880, in the House of Representatives, he brought home to the nation the great part borne by the invention of Sir Henry Bessemer, in the mighty expansion in that year of our industrial forces. In 1883, at the opening of the Brooklyn Bridge he delivered an oration unequalled before or since as an eloquent and philosophic exposition of the importance and achievements of the iron workers of America. In 1890, before the great gathering of American and British engineers, he made an address commemorative of Alexander B. Holley, and his introduction and adaptation of the Bessemer process in America, and an exhibition of results which won for him, the first and only American to receive it, the gold medal of the British Iron and Steel Institute, and the concession of its president, Sir Ramsay Watson, that for the first time America had surpassed Great Britain in its output of pig iron. His very last public utterance was a remarkable letter in October, 1902, in commendation of the career of John Fritz, of the Bethlehem Steel Company. This splendid record, perfect as it is, attests the pre-eminent position of Mr. Hewitt as the public representative of the iron industry of America.

Into the organization and development of the United States Steel Corporation Mr. Hewitt entered with all the enthusiasm of his nature and devoted to its affairs his high intelligence and careful scrutiny. He was present at all but four of the meetings of the board beginning with the first. In December, 1902, he made what then was feared, and the event proved to be his last appearance. At every meeting he was vigilant and attentive and his keen scrutiny and shrewd suggestions were of great and lasting value to the conduct of our most important business. Missed as he will be from the councils of many societies, political, philanthropical, educational and financial, nowhere will it be more difficult to fill the place of Mr. Hewitt than in this body, peculiarly representing his life's work, of which with a sincere and respectful admiration this brief minute is made by his fellow-members of the board of directors of the United States Steel Corporation.



## TECHNICAL.

## Manufacturing and Business.

The Davenport Locomotive Works has appointed O. R. Whitney its Eastern representative. His address is 39-41 Cortlandt street, New York.

The American Lock Nut Co. has been incorporated under the laws of New York State. L. W. Haring, F. Wilson and Abel Lagerslimin, incorporators.

The Ingersoll Car Company has been incorporated in New York with \$50,000 capital, by Robert S. Green, Russell C. Leffingwell and Albert C. Wall.

L. T. Canfield, formerly Master Car Builder of the Lackawanna, is now Vice-President of the Standard Railway Equipment Co. of St. Louis, Mo.

The American Railway Lamp Co. has been incorporated in New York City, with a nominal capital of \$2,000. F. W. Dressel, C. H. Dressel and Robert Black, of New York, are the incorporators.

The Eastern Electric Contract Co., 243 Washington street, Jersey City, N. J., has been incorporated with \$100,000 capital by Chas. N. King, W. H. Greene and Le Grand Bouker, to build railroads.

The New Jersey Bridge Company has been incorporated with \$100,000 capital by Casper W. Dean, P. E. Lane and John A. Eaton to build bridges. The principal office will be at Villa Park, N. J.

Reports from Wheeling, W. Va., state that a company is being formed in that city to make the Davies car wheel. At present the wheels will be made by the Wheeling Mold & Foundry Co., of that city.

The International Brake-Shoe & Foundry Co. has been incorporated in New Jersey, with \$150,000, by Frank R. Searles, Gardner W. Kimball and C. Frederick Smith. The principal office will be at 525 Main street, East Orange, N. J.

The next time we fight Spain we shall have to fight also the designers and makers of American engineering material. The Spanish Government is installing Westinghouse motors in its gun shops at Trubia and in the arsenal at Ferrol.

The Thornton N. Motley Company, Incorporated, New York, has just shipped 60 freight cars for the Consolidated Railroads of Yucatan, recently formed. The contract was secured through Felipe G. Canton, of No. 29 Broadway, New York.

George H. Gibson has resigned his position with the Westinghouse Companies' Publishing Department, to accept a position with the B. F. Sturtevant Company. Mr. Gibson is a graduate of the Engineering School of the University of Michigan.

The New York Railway Supply Co. has been incorporated in New Jersey with \$250,000 capital stock. The principal office is at 1 Exchange Place, Jersey City. The company proposes to build cars. Those interested are C. T. Gramont, W. H. Thorne and F. W. Thorne.

The Taylor Electric Truck Co., of Troy, N. Y., has been incorporated in New York State to make steel cars and car trucks, wheels and other appliances for cars. The capital is placed at \$75,000. Wm. F. Gurley, John Taylor and A. Louise Gurley, of Troy, are the directors.

The Northwestern Bridge & Construction Co., Ltd., with headquarters at Boise, Idaho, has been incorporated to build bridges and do other construction and contract work. The directors are F. J. Conroy, of Nampa, Idaho; C. W. Cooper, of Caldwell; J. W. Hall, B. R. L. Poston and L. M. Hall, of Boise. The capital stock is \$100,000.

The Wells Light Mfg. Co., (Edward Robinson, Sole Proprietor), 46 Washington street, New York City, which supplied the lights for night work on the underground road now being built in New York City, has received an order from Canavan Bros., contractors, for six Wells lights for use at night in shoring up buildings along the line of the subway on Park avenue.

The Baldwin Locomotive Works are turning out six locomotives a day. The plant is being run day and night and President Converse says it is impossible to meet the demands of the railroads for motive power. The works employ 13,000 men. The company is now delivering seven locomotives every six days upon the order of the Pennsylvania Railroad for 350 locomotives.

The Gould Coupler Co. is filling at its Buffalo works a large order for couplers, for both freight and passenger service, for two of the principal railroads of Japan. The company has recently equipped the private car of the President of the Lehigh Valley with its system of electric lighting, and is equipping two dining cars for the same road and the private car of President Underwood, of the Erie.

The Manufacturers Railway Supply Co. announces that the marketing of the Interlocking brake-shoe, which it makes, has been placed in absolute control of the following companies: The Coffin-Megeath Supply Co., Franklin, Pa.; the Republic Railway Supply Co., Lincoln Trust Building, St. Louis, Mo.; the Spencer Otis Co., Plymouth Building, Chicago, and U. S. National Bank Building, Omaha, Neb.

Rails in large quantities, structural steel, billets, etc., are being shipped from Germany through the London office of Messrs. F. R. Phillips & Sons Co., of Philadelphia and Pittsburgh, whose Antwerp connections facilitate inspection and shipment. The company has just shipped machinery and necessary equipment for a tin

plate rolling mill plant in Italy. This is the first plant of the kind exported from the United States.

E. H. Symington, M. E., for the past two years Assistant Superintendent and Mechanical Engineer for the Kilbourne & Jacobs Mfg. Co., Columbus, Ohio, in charge of new central station electric power installation and other shop improvements, has resigned to go into the railroad supply business with T. H. Symington & Co., Baltimore, Md. He was formerly Assistant Master Mechanic at the shops of the Lehigh Valley at Sayre, Pa.

The Otis Elevator Company report the following contracts recently closed: North German Lloyd Steamship Company, Hoboken, N. J., 10 electric passenger elevators; Kean Van Cortlandt & Company building, Pine street, New York, four hydraulic elevators; Hotel Willard, Washington, D. C., four hydraulic elevators and two electric elevators; and the Belvidere Hotel, Baltimore, Md., seven plunger elevators with a car travel of 160 ft.

The major portion of the machine tools, etc., which, in all, will result in an expenditure of over \$600,000, for the Locomotive & Machine Works of Montreal, has been awarded a Canadian concern, Bertram & Co., of Dundas, Ont. Manning, Maxwell & Moore, and the Niles-Bement-Pond Co., of New York, have, however, taken substantial contracts, notwithstanding the 25 per cent. Canadian import duty on foreign machinery. The contract for cranes has been let to the Whiting Foundry Machine Equipment Co., of Harvey, Ill.

At the annual meeting of the Railway Appliance Co. of Albany, held in that city Jan. 28, the following directors were elected: John A. Howe, Jr., Alexander Selkirk, John A. Howe, Edwin B. Howe, Frank E. Selkirk, Willis G. Nash, Howard N. Fuller, John J. Sill and John A. Selkirk. John A. Howe, Jr., is President; Willis G. Nash, Vice-President; Frank E. Selkirk, Secretary and Treasurer, and Alexander Selkirk, General Manager. This company was incorporated a little over a year ago, and during that time has made considerable progress in making electric and steam railroad appliances of all kinds. It contemplates enlarging its plant during the present year.

Under date of Jan. 31, 1903, the Railway Appliances Company and the Q & C Company announce that the business and affairs of these companies will be consolidated, and hereafter conducted in the name of the Railway Appliances Company. The officers are: H. K. Gilbert, President; C. F. Quincy, Vice-President; Percival Manchester, Secretary; Geo. H. Sargent, Manager. The headquarters are in the Old Colony Building, Chicago, with branches in all of the principal cities of the United States and in London, Paris, Berlin and Montreal. The large list of specialties handled by the new company includes supplies for the locomotive and car departments, the engineering and track departments, the machinery and tool departments of steam roads, and also a large number of street railroad devices.

## Iron and Steel.

Wm. H. James, who organized the Grant Smelter Co., and the Colorado Fuel & Iron Co., is dead at his home in Colorado. He was 65 years old.

William H. Miller, of the firm of Miller & Van Winkle, manufacturers of steel wire and steel springs in Bridge street, Brooklyn, N. Y., died last week.

Wm. H. Cross, Assistant General Superintendent of the Passaic Rolling Mills Co., and a member of the Board of Aldermen of Paterson, N. J., died on Feb. 3 in Paterson. He was born in Troy, N. Y., 39 years ago.

The Damascus Steel Co., with \$2,500,000, has been incorporated in New Jersey by Robert N. Clyde, Augustus W. Condit and Chas. O. Geyer. This is probably the company which is to operate at Des Moines, Iowa.

It is understood that the United States Steel Corporation is planning to further extend the relief fund system in its mines. At present the Carnegie relief fund applies only to the mines which were in the Oliver Iron Co. prior to its absorption. The extension will affect about 14,000 men.

At the Washington Navy Yard work is to be carried on by three shifts of men in the gun carriage shop in order to expedite the completion of the large number of orders, many of them having been given some time ago, and it is stated that a considerable number of expert machinists are needed.

The Spanish-American Iron Company (controlled by the Pennsylvania Steel Co.) is about to develop extensive mines, copper and silver, in the vicinity of Santiago de Cuba, which have been worked by the Cubans about 30 years ago but which have been lying dormant since then. Six miners have already sailed for Cuba to pump out the mines. The pumping machinery is being furnished by the F. M. Prescott Steam Pump Company, of Milwaukee, Wis.

## Fort Pitt Bridge Works of Pittsburgh, Pa.

The annual meeting of the stockholders of the Fort Pitt Bridge Works was held at the company's Pittsburgh office on Jan. 27. It was announced that the improvements under construction during the past year are now complete, increasing the annual capacity to 25,000 tons. The old board of directors was re-elected and the management continued as heretofore.

## Southern Car &amp; Foundry Company.

A change has been made in the personnel of the Southern Car & Foundry Co., since the Standard Steel Car

Co. got control. The officers now are: J. M. Hansen, President, Pittsburgh, Pa.; A. Campbell, Assistant to President, Birmingham, Ala.; W. O. Jacquette, Vice-President, New York, N. Y.; M. E. Duncan, General Manager, Birmingham, Ala.; W. G. Brockway, Treasurer, Birmingham, Ala. The District Managers are as follows: J. H. Allman, Acting District Manager, Anniston, Ala.; Geo. Rees, District Manager, Memphis, Tenn.; H. F. Westcott, District Manager, Gadsden, Ala.; Samuel Marfield, Assistant Treasurer, Lenoir City, Tenn. Some improvements are being made to the various plants (Anniston and Gadsden, Ala., and Lenoir City and Memphis, Tenn.), but they are not very important.

## Electric Train Lighting.

The Pullman Company has given an order to the New York Headlight & Train Lighting Co. for three additional units of the De Laval generating system for equipping the remaining Pennsylvania Limited trains. One of these trains has been lighted by this system for some time, and the service obtained from it has resulted in the decision to equip the rest of these trains with the same system. It will be four months or more before the apparatus will be ready for installation.

## Interlocking.

The Pneumatic Signal Co. has taken the contract to put in a low-pressure pneumatic interlocking plant for the New York Central & Hudson River Railroad at Carman, N. Y. The same concern has received an order for a mechanical interlocking plant for the Chicago & Alton, at Springfield, Ill.; one for the Union Railway at Indianapolis and one for the Illinois Central at 33rd street, Chicago.

The Central of Georgia, the Atlantic Coast Line and the Seaboard Air Line will unite in the erection of interlocking signals at the crossing of these roads in Savannah.

## Civil Engineers for the Navy.

A board of five Naval officers, of which Commander R. E. Peary, U. S. N., is President, has been appointed by the Navy Department to conduct examinations to be held in New York and Chicago beginning Feb. 21 next to fill vacancies in the Corps of Civil Engineers of the Navy. Some description of these examinations was given in this column last week.

## Republic Iron and Steel Company.

A statement of earnings of the Republic Iron & Steel Co. for the six months ending Dec. 31 last, shows net profits of \$1,384,125, a gain of \$450,124. President Thompson says that the company has acquired since June 30, 1902, ore properties making now a total of 19,000,000 tons, or enough to supply the company's plants for 30 years.

## Pressed Steel Car Company.

The annual report for the year ending Dec. 31 shows profits for the year of \$4,578,114, an increase of \$2,650,189. The extra dividend of 1 per cent., just declared on the common stock, places that stock on a 5 per cent. basis. The surplus last year, after allowing for depreciation and renewals, preferred dividends and other charges, was equivalent to 21.05 per cent. on the common stock. In 1901 the net earnings on the common stock amounted to only 3.1 per cent. H. E. Moller has resigned as a director, and James A. Blair was elected to succeed him. The company has outstanding \$4,104,000 in 5 per cent. first mortgage gold bonds. Of these, \$104,000 were due on Feb. 1, this year, and \$500,000 will be due on Feb. 1, 1904. The company has bought up the former, and is about to pay off the \$500,000 due in two years, which will reduce the outstanding notes to \$3,500,000.

## To Repair Air-Brakes.

A number of Pittsburgh people have incorporated the Western Air-Brake Repair Co., the purpose being to do a general machine business and make a specialty of repairing air-brakes. Albert L. Swift and R. W. Anderson are interested.

## Virginia Coal &amp; Coke Company.

The New York Stock Exchange has listed \$8,641,000 capital stock, and \$6,993,000 first mortgage 5 per cent. 50-year coupon bonds of 1904, of this company. In the prospectus issued at the time of the registering of this stock the company states that the receiver appointed Feb. 6, 1901, was discharged Jan. 1, 1903.

## New Bridges on the Wabash.

Nine new steel bridges are to be built on the Wabash R. R. between Kansas City and St. Louis. Seven will be between Kansas City and Moberly. Contracts for these bridges have been let and work will be begun soon. An officer of the company is reported as saying that there is no prospect for a Wabash bridge over the Missouri at Kansas City.

## German Shipbuilding.

German shipyards in 1902 built 227 steamers of 212,283 tons register, a decrease of three steamers and 49,000 tons in comparison with 1901. The steamers under construction at the year's end numbered 121, of 255,977 tons, against 142, of 317,080 tons in 1901. Two hundred and eighty sailing vessels, of 58,715 tons, were built in 1902, being an increase of 69 vessels and 28,000 tons.

## Washington Filtration Plant.

Bids for constructing the filtration plant for the District of Columbia were opened Jan. 28 at the office of Col. A. M. Miller, Corps of Engineers, U. S. Army, in charge



of the Washington Aqueduct. Three bids were submitted and on the ground that they are unreasonable in terms and in excess of the funds available for the work, Col. Miller has recommended that they all be rejected and the work re-advertised, and the matter is now in the hands of Gen. Gillespie, Chief of Engineers, for final action. The bids which were all in great detail were: New York Continental Jewell Filtration Co., \$1,258,225 for 24 filters and \$1,388,870 for 29 filters, these bids, while the lowest, being incomplete in making no provision for the gravel and sand called for in the specifications; D. J. McNichol, of Philadelphia, \$1,937,265 for 24 filters and \$2,209,678 for 29 filters; Harmer & Quinn, of Philadelphia, \$2,190,393 for 24 filters and \$2,479,540 for 29 filters, the last two bids being complete in all details. The lowest bid for cement was \$220,725 for 24 filters and \$256,695 for 29 filters from the Virginia Portland Cement Company.

At a hearing before the Senate Committee in the District of Columbia last week the proposed use of alum as a coagulant before the water passes through the filtration plant was discussed. Mr. Allen Hazen was present and favored the use of alum, which was opposed by a number of physicians, who argued against the use of alum even if the water without it should not be quite clear at times.

#### New Power Plant at Niagara.

Despatches state that the Ontario government has issued an order in council granting a franchise to the New Toronto-Niagara Power Company, in which only Canadian capital is interested. This company will build a power plant on the Canadian side of the Niagara River, near the Falls, which will cost \$5,000,000. It will have a capacity of 125,000 h.p. and will be completed in two years.

#### Nickel-Steel Rails.

The Edgar Thomson Works of the Carnegie Steel Company has orders for 9,000 tons of nickel-steel rails, of which 2,500 tons have already been finished. Five thousand tons are for the Pennsylvania, 3,000 tons for the Pennsylvania Lines West of Pittsburgh, and 1,000 tons for the Baltimore & Ohio. The angle splice bars are also nickel steel. The material for rails and bars is to be of the usual composition with from 3/4 to 3 1/2 per cent. of nickel added thereto. The order includes only 85 lb. and 100 lb. sections. The nickel was furnished by the Orford Copper Company, New York, one of the constituent companies of the International Nickel Company.

#### The Steel Trade.

Mr. Gary, chairman of the United States Steel Corporation, says that at the present time the unfilled orders on the books of subsidiary companies amount to 5,500,106 tons, which is the highest since the organization of the corporation; that the orders booked weekly are materially larger than the shipments made; that in many lines of products the orders booked will keep the mills busy until the early part of 1904; that in some lines it has never been usual to purchase very many months in advance, but with reference to these the conditions at the present time are unusually favorable; that the demand in all lines is good, and there is nothing in sight to indicate any change for the worse; that during the last few months prices have not materially changed, except in a very few instances where prices had been reduced to meet unusual conditions they have been restored.

#### The Pullman Company To Inaugurate Nine-Hour Day.

Beginning April 1 the Pullman Company expects to reduce the weekly working time of its works employees from 60 to 54 hours a week, which is equivalent to a nine-hour day; wages still to be paid on the 60-hour basis. The matter has been under consideration for some time past and has finally been arranged as above. The number of employees affected approximates 7,000. Whether or not the new arrangement will necessitate any increase of force will be determined after it has been put in working order. It would seem that some increases will be necessary, as the reduction in time amounts to 42,000 hours a week.

#### Mexican Central Bridges.

Contracts for seven pin-connected bridges have just been let by the Mexican Central Railway to Andrew Handyside & Co., Ltd., of Derby, Eng. They vary in length from 135 ft. over all to 180 ft. over all. Several plate girder bridges are under consideration, the contracts for which will be let in the United States shortly. Contracts for small I-beam bridges have been let to Miliken Brothers, New York. These bridges are to replace wooden structures on the Monterey Division and the contracts are being let by F. P. McIntyre, Purchasing Agent, 52 Broadway, New York.

#### Pyle-National Electric Headlight.

The Pyle-National Electric Headlight Co. is equipping for its acetylene car lighting department a plant on Seventy-third street near Ellis avenue, Chicago, which will be used for testing and charging the tanks for the lighting system. A 5,000-ft. per hour Williamson acetylene gas generator is being put in, also a holder having a capacity of 5,000 cu. ft. A compressor with a capacity of 2,500 ft. per hour will compress the gas to 240 lbs., which is the charging pressure for the tanks. Small jib cranes and other devices necessary to rapid handling of the tanks and apparatus are being installed, the total expenditure for the work being expected to reach \$10,000. Arrangements have been made with the Pressed Steel Tank Co., of Milwaukee, Wis., for the tanks, and pro-

vision for testing each one at the new plant has been made, with hydraulic pumps installed for that purpose. The tanks will first be charged with acetone, and this liquid is to be made the test medium.

At the annual meeting of the stockholders of the Pyle-National Electric Headlight Co. held at Jersey City, N. J., on Wednesday, Jan. 14, the following members of the Board of Directors were elected: Wm. F. Vilas, Madison, Wis.; Chas. H. Deere, Moline, Ill.; Wylie H. Vilas, East Orange, N. J.; Granger Farwell, James Vilas, Jr., Edward E. Ayer and R. C. Vilas, Chicago. The Directors met on Jan. 27 and elected the following officers for the ensuing year: President and Treasurer, Royal C. Vilas; Vice-President, James Vilas, Jr.; Secretary, E. B. Gorrie.

#### New Shops for the Rock Island.

Reports from Rock Island, Ill., state that the Chicago, Rock Island & Pacific has acquired a large tract of land at East Moline, Ill., on which large shops are to be built. Our understanding is that the preliminary plans are now under consideration, it being the intention to make this one of the largest and most conveniently arranged railroad shop plants in the country. The size of the tract, according to the reports, is 900 acres, the purchase price being \$200,000.

#### The American Car & Foundry Co.

The American Car & Foundry Company reports for the seven months ended Nov. 30, 1902: Net for four months to Aug. 31, 1902, \$2,322,618, 1901, \$1,086,864; net for three months to Nov. 30, 1902, \$2,152,245, 1901, \$938,612; total net seven months, 1902, \$4,474,863, 1901, \$2,025,476; dividends preferred three quarters, 1902, \$1,575,000, 1901, \$1,575,000; dividends, common, three quarters, 1902, \$600,000, 1901, \$450,000; surplus, 1902, \$2,299,863, 1901, \$476; previous surplus, \$6,670,552, 1901, \$5,974,950; total surplus, 1902, \$8,970,415, 1901, \$5,075,426.

#### THE SCRAP HEAP.

##### Notes.

It is announced that the Black Diamond express of the Lehigh Valley, which was recently discontinued west of Wilkesbarre on account of the congestion of freight traffic, is to be resumed on Feb. 5.

An officer of the Great Northern Railway is reported as saying that by the removal of the import duty on coal the company saves \$4,000 a day on its importations from the Crow's Nest coal mines in Canada.

The New York Central has lately appointed a large number of local railroad surgeons and is instructing employees in "First aid to the injured." Emergency hospital boxes are to be carried on all passenger trains.

The headquarters of the Voluntary Relief Department of the Pennsylvania Railroad will soon be moved from Trenton to Philadelphia. The office will be in the new building at 15th and Filbert streets. About 85 clerks living in Trenton will have to work in Philadelphia. To employees thus situated the Pennsylvania sells season tickets at very low rates.

While most railroads are nowadays trying to hasten the unloading of freight cars by reducing the free time allowed consignees, the Great Northern has taken action in the opposite direction. On that road the free time allowed has been only 24 hours, either to the shipper or the consignee, and the demurrage rate was \$2 a day; the free time has now been extended to 48 hours and the rate reduced to \$1.

##### Traffic Notes.

Mr. P. H. McNemer, recently rate clerk of the Texas State Railroad Commission, has resigned to become manager of the Houston Freight Bureau.

The latest bon mot of President Stickney, of the Chicago Great Western, appears to have had its birth in Mr. Stickney's Oriental experience. Referring to the alleged action of a competing road in reducing the rate on live stock between Kansas City and Chicago from 23 1/2 cents to 12 1/2 cents, Mr. Stickney said: "When an Anglo-Saxon feels himself aggrieved he comes out in the open and squares away for a fight, but when the Asiatic has a grievance against his neighbor he commits suicide on his own doorstep. The Atchison road is not run, I guess, by Anglo-Saxons."

In Georgia there is a law making the initial railroad responsible for locating losses and damages on joint traffic. The statute was passed in 1890, and requires the railroads forwarding a shipment, if the goods are damaged to designate the intermediate carrier on whose line the goods were damaged; and the initial carrier is to be held liable for the damage upon its failure to tell where the damage occurred. A shipment of grapes was made to Omaha, the shipment being made over the Central of Georgia as the initial handler. The grapes arrived at their destination greatly damaged. The shippers made demand on the Central for information on which line the damage occurred, but the information asked for was not given. Suit was entered against the Central and the case was decided against the railroad. Now the road proposes to take the case to the United States Supreme Court.

#### Reduction in Joint Freight Rates in Mississippi.

As the result of a two days' conference between the Railroad Commissioners and the general freight agents, it is announced that the railroads agree to make on traffic from connecting lines originating in Mississippi to points in Mississippi, the following reduction, to take effect March 1, 1903:

On hauls of 50 miles or less a reduction of 10 per cent. from present rate.

On hauls of over 50 and under 100 miles a reduction of 15 per cent. from present rate.

On hauls of 150 and over a reduction of 20 per cent.

The lowest combination possible on the above basis is to be applied where the traffic moves over more than

two lines. Heretofore through rates were the sum of the locals.

#### A Laboratory Locomotive for Cornell.

The Baldwin Locomotive Works has offered to present to Sibley College a laboratory locomotive of the Vauclain-de Glehn type, upon plans to be agreed upon by the Baldwin Works and Prof. H. W. Hibbard principal of the School of Railway Mechanical Engineering. The gift will not be consummated until a building and testing machine are provided. It will be a four-cylinder, balanced compound, like the engine built for the Plant System, but with four truck wheels and four driving wheels. The boiler will be designed to carry 300 lbs. gage pressure. It is intended to be very easily convertible into a perfectly balanced two-cylinder simple engine by the removal of the two high-pressure cylinder bushings and a change in the valves. The details of the engine have not as yet been worked out. No work at all has as yet been done on the designing of the testing machine, awaiting the development of the design of the locomotive, its weight and power. The usual road tests by Seniors are to be continued and the laboratory locomotive will only supplement the present course.

#### European Notes.

The boring of the Simplon Tunnel is continuing at the rate of 11 1/2 meters per day and the completion of the rough bore is expected at or about May, 1904, while the lining may be finished by about November of the same year. Of course should any fresh spring be discovered or any unforeseen change in the rock the work will be no doubt delayed.

If the new line in Switzerland from Vallorbes is not ready in time for the opening, trains will be run from Basle to Domo Dossola and Milan, taking 9 and 11 1/2 hours respectively.

R. HOPE.

#### A Verdict for \$62,165.

The New York State Court of Appeals, the highest court of the State, has affirmed the judgment of \$62,165 obtained by Mrs. Lottie G. Dimon against the New York Central & Hudson River Railroad Company for the death of her husband, Henry G. Dimon, who was killed in the tunnel disaster in New York on Jan. 8, 1902. The court unanimously affirms a decision of the Appellate Division, First Department, affirming a decision of the trial term, which awarded her \$60,000 damages and \$2,165 costs. This is the first damage suit growing out of the tunnel disaster to be decided by the Court of Appeals. The verdict was one of the largest ever given for a single death in a railroad accident. A New York paper says: "Mr. Dimon was 35 years old. He was a graduate of Cornell University, and was employed as a civil engineer by the American Bridge Company at a salary of \$4,000. The case was appealed on the question of excessive damages."

"Rather than fight appeals the company has just paid the following judgments: Jessie W. Meyrowitz, for the death of her husband, Oscar Meyrowitz, \$21,496.19; Amanda E. Cox, for death of daughter, Mrs. A. F. Howard, \$16,326.63; Mabel Newman, injuries, \$10,000; Horace Crosby, for death of son, \$8,105.38; for death of W. E. Howard, \$15,500; Minnie Rice, injuries, \$17,500; Peter Murphy, injuries, \$18,500; other settlements, \$300,000."

#### For the Information of Passengers.

The following is taken from an advertisement in the Guide to Osaka (Japan). The through train services between two termini of OSAKA and NAGOYA are operated five times, of which two being the EXPRESS TRAIN, from either terminus per day with all the carriages of bogie system, which accompany a uniformed attendant and provision sellers, making themselves to be useful.

#### Increased Service on the Manhattan Elevated.

The company has announced an increase in service on all its lines, in accordance with the recommendation of the Railroad Commissioners. The new schedule provides for 277 additional train trips daily, involving 3,657 more car trips, and an increase of 175,536 in the seating capacity provided. The new schedule in totals is as follows:

	No. of trips.	No. of cars.	Seating capacity.
Second avenue line.....	538	2,652	127,296
Third avenue line.....	1,062	5,824	279,552
Sixth avenue line.....	1,118	6,018	283,864
Ninth avenue line.....	669	2,945	141,360
Totals .....	3,387	17,439	837,072

#### INCREASE IN SERVICE.

	Inc. of trips.	Inc. of cars.	Inc. in seating capacity.
Second avenue line.....	82	186	8,928
Third avenue line.....	82	1,124	53,962
Sixth avenue line.....	98	1,650	79,200
Ninth avenue line.....	97	697	33,456
Totals .....	277	3,657	175,536

#### Report of the Commissioner of Patents.

The annual report of Mr. F. T. Allen, Commissioner of Patents, for the calendar year 1902 shows that during the year there were filed applications for 48,320 patents, 1,170 designs, 151 re-issues of patents, 2,602 trade marks, and 1,121 labels. Of these 27,776 patents and designs were issued, 110 patents were re-issued and 2,006 trade marks and 767 labels and 158 prints were registered. New patents and re-issues amounted to 27,886, the largest number ever issued in a single year; and the number of patents that expired was 23,331. The office expended \$1,393,345.54, and the excess of receipts over expenses was \$159,513.54. An increase of force of 35 examiners and three clerks was allowed July 1 last and a further increase of clerical force is desirable.

#### The Union Pacific Strike.

At last the Union Pacific Railroad has made a public statement concerning the strike of its shop men. In the report of a conference held at Omaha last week Friday, when the boiler makers, headed by Mr. McNeil, again refused to accept the piece work system and were again told by President Burt that they could work on no other terms, it is stated that the railroad company made the following announcement:

Piece work has been a successful system in the shops of our company for six months past, and the committee representing the strikers was told that no change in the system could be made at this time. About 85 per cent. of the work done in the Omaha shops is by piece work: 100 per cent. of it at Armstrong and from 90 to 100 per cent. at other places.

We now have more men in the shops here than we ever had before, and their character and skill are all that



we could ask. A reduction soon will be necessary, because our busiest season is now over. The same condition applies to all other points on the line. With new shops and new machinery here, the same number of men can do more work than formerly. In point of work done here, we have never turned out so many engines in the history of the shops as during the last six months, and the same is true at Cheyenne.

If we were to take back the strikers now it would mean that our force in the shops here would be crowded out, and this we dislike to do, but we would not have room for two forces.

Our train service is becoming better, last week being 100 per cent. better than during the previous weeks. We are having some trouble this week because of high winds and stormy weather out west, for which the strikers will probably claim credit. Last week we put twice as much coal into Nebraska as during any previous week on the road, and every mine at Rock Springs is running at full capacity.

Six new engines have just arrived, and four more are on the road, and an indefinite number of new engines will continue to arrive. We will soon have engines to burn. This strike is over, so far as the company is concerned. The men quit the service last June and we hired new men to fill their places. That's all there is to it.

#### The Railway Ticket Bureau.

This is the name of the organization, recently proposed in the west, and noticed in the *Railroad Gazette*, which is to be established for the purpose of detecting and prosecuting ticket forgers, counterfeiters, and unlawful manipulators of tickets. It was finally agreed upon last Tuesday in New York city, at a meeting of representatives of all the important roads. The meeting was presided over by George H. Daniels, of the New York Central & Hudson River Railroad. The plans for the complete organization are to be perfected by an Executive Committee, consisting of one Commissioner from each railroad passenger association, which is to meet at the earliest moment. The following associations were elected to membership: The Trunk Line Association, the Central Traffic Association, the New England Traffic Association, the Transcontinental Passenger Association, the Southern Traffic Association, the South Western Traffic Association, and the South Eastern Traffic Association. Owing to the absence of power of the delegates of the latter association to accept the election, it was laid on the table subject to approval of the South Eastern Association.

#### LOCOMOTIVE BUILDING.

The *National Tool Co.* is having two locomotives built at the Baldwin Works.

The *South Buffalo Ry.* is having four locomotives built at the Baldwin Works.

The *Lake Shore & Michigan Southern* is having one locomotive built at the Brooks Works.

The *Norfolk & Western* is having 30 locomotives built at the Cooke Works of the American Locomotive Co.

The *Buffalo & Susquehanna* is reported to have ordered five locomotives of the Chautauqua type from the Brooks Works.

#### CAR BUILDING.

The *West Side Lumber Co.* is having 24 freights built by W. L. Holman.

The *American Car & Foundry Co.* has miscellaneous orders for 273 cars.

The *Union Pacific* has ordered 1,400 flat cars from the Standard Steel Car Co.

The *Pennsylvania* is in the market for 31 coaches, 11 baggage, two cafe and one dining car.

The *Paragould & Memphis* is in the market for one combination passenger and baggage car.

The *New York, Ontario & Western* has ordered 100 box cars from the American Car & Foundry Co.

The *Chicago, Indianapolis & Louisville* has ordered two coaches from the American Car & Foundry Co.

The *Tacoma Eastern* is having 32 freights built at the Chicago Works of the American Car & Foundry Co.

The *Texas Southern* is having six freights built at the St. Louis Works of the American Car & Foundry Co.

The *Buffalo & Lake Erie* is having 15 freights built at the McKees Rocks plant of the Pressed Steel Car Co.

The *Cleveland, Cincinnati, Chicago & St. Louis* has ordered 1,000 gondolas from the American Car & Foundry Co.

The *Edison Crushed Stone Co.* is having 16 freights built at the Detroit Works of the American Car & Foundry Co.

The *Mexican Coal & Coke Co.* is having 20 freights built at the Jeffersonville Works of the American Car & Foundry Co.

The *Chicago Great Western* has ordered 500 box cars of 70,000 lbs. capacity, 100 furniture and 100 stock cars, all from Pullman Company.

The *Atchison, Topeka & Santa Fe* has ordered 1,500 box cars from the American Car & Foundry Co., and 1,200 box cars from the Southern Car & Foundry Co.

The *Southern*, according to apparently reliable information, has ordered 1,000 cars from the South Baltimore Car Works, but we have not received as yet official confirmation of this report.

The *Seaboard Air Line* has ordered 10 coaches from the Niles Car Mfg. Co., 61 ft. over end sills, 10 ft. ½ in. wide and 14 ft. 3 in. high over all, with wooden underframes. The special equipment includes steel axles, National hollow brake-beams for six-wheel trucks, Westinghouse high-speed brakes, Ajax brasses, National couplers, Acme curtain fixtures, Safety steam heat, direct system, two Spear stoves for auxiliary use, M. C. B. iron journal boxes, McCord journal box lids, Pintsch gas, Murphy's paint, Standard steel platforms and No. 7 sail-ducking roofs, American Spring Co. springs, six-wheel trucks, wide vestibules and 36-in. steel tired wheels.

#### BRIDGE BUILDING.

ARKANSAS.—In the U. S. Senate on Jan. 28 a bill was introduced authorizing the Memphis, Helena & Louisiana

Ry. to build and maintain a bridge across St. Francis River, in Arkansas.

ASHER, OKLA. T.—Articles of incorporation have been filed by the company which has just been organized to bridge the South Canadian River at Asher. Those interested are J. C. Milner, Reid Riggins and Geo. G. Boggs, all of Asher, and I. A. Smith, of Tecumseh, Okla. T. The capital stock is \$20,000 to start with. We recently reported that the preliminary soundings were under way.

AUBURN, PA.—R. J. Bowman, of Mahanoy City, has been selected by the Board of Public Grounds and Buildings to make the plans and specifications for the new bridge to be built over the Susquehanna River at Auburn. It will be a steel truss 150 ft. long, with an 18-ft. roadway. The cost is estimated at \$15,000.

BARKWAY, ONT.—It is said that a steel bridge over Buck River is proposed near Housey's Rapids.

BELEN, N. MEX.—The bridge which the Atchison, Topeka & Santa Fe will build over the Rio Grande, is on the line of the Eastern Ry. of New Mexico. It will consist of seven 100-ft. girders. The erection will be done by the company's own forces.

BOSTON, MASS.—According to local reports, there is some probability of the city spending between \$50,000 and \$60,000 to widen the draw of Congress street bridge.

CANAJOHARIE, N. Y.—No bids were received Jan. 20 by the State Superintendent of Public Works at Albany, for the lift bridge over the canal at Church street.

CHARLOTTE, TENN.—J. R. Neblett will receive bids shortly for a bridge to be built over Jones Creek.

CHICAGO, ILL.—Reports state that the Pennsylvania Company has notified the special committee of the South Park Board appointed to adopt plans for the elevation of the railroad tracks across Western avenue, that the company has decided to build a steel arch.

CLARKSVILLE, TENN.—The contract for the superstructure of the draw in the bridge over Cumberland River at Clarksville for the Louisville & Nashville, has been let to the American Bridge Company.

CORNING, N. Y.—A steel bridge consisting of four 150-ft. spans will be built over Chemung River. The estimated cost is \$40,000. Robert O. Hoyt, City Engineer.

DAUPHIN, PA.—The Pennsylvania R. R. proposes to build a new steel bridge at Dauphin to run diagonally from Dauphin to the western end of Maysville.

DENVER, OHIO.—R. H. Walker, Deputy County Surveyor, Chillicothe, writes that bids are wanted at any time for a mild steel riveted truss bridge over Crooked Creek.

EMMETTSBURG, IOWA.—Bids are wanted at the office of Thomas R. Martin, County Auditor, until noon of Feb. 11, for building all bridges needed in Palo Alto County during the year 1903.

ERIE, PA.—The County Commissioners are considering building a new bridge over the Codorus.

FALL RIVER, MASS.—The question of a new bridge over Taunton River, between Fall River and Somerset, is before the Massachusetts Legislature. The location and design of this proposed bridge have not been definitely fixed, but several prospective plans have been made. Two show deck bridges and two through structures. Two sites are in contemplation. The costs vary from \$830,000 to \$1,000,000 or more.

FORT LARAMIE, WYO.—Joseph Cahill, County Clerk at Cheyenne, will receive bids Feb. 17 for a combination bridge over Platte River at Fort Laramie.

FRANKLINTON, LA.—P. B. Carter, Chairman of the County Commissioners, will receive bids until March 6 for a steel bridge 160 ft. long over Chitto River in Washington Parish.

GEORGIA.—A bill has been introduced in the House of Representatives authorizing the Wadley & Mt. Vernon R. R. to build a bridge across Oconee River, in Georgia.

GRAND ISLAND, NEB.—Hall County is advertising for bridges to be built during 1903. J. L. Schaupp, County Clerk.

HARRISBURG, PA.—It is reported that the Pennsylvania R. R. will build a steel superstructure on the long unused piers built in the Susquehanna River at this point some years ago by the projected South Pennsylvania R. R.

HARTFORD, CONN.—On Jan. 29 a bill was introduced in the U. S. Senate and House of Representatives authorizing the Board of Commissioners for the Connecticut Bridge & Highway District to build a bridge across the Connecticut River, at Hartford, Conn.

HOUSTON, TEXAS.—The Southern Pacific Co. proposes to build a new bridge over Berwick Bay at Morgan City, replacing the present structure. It is said the new bridge will be a steel structure to consist of six spans, each 250 ft. long, and one draw span of 270 ft., making the total length 1,650 ft. The cost will be over \$500,000. The water in the bay varies in depth from 6 to 60 ft.

The question of building a new bridge at the foot of Main street across the bayou and connecting with the Fifth Ward, is again under consideration. There is also talk of rebuilding several other bridges in this city—one in particular the San Jacinto street bridge.

KANSAS CITY, MO.—The Hannibal & St. Joseph R. R. bridge across the Missouri River here may be rebuilt. It is said that the plans for a new steel superstructure have been made which provide for two tracks. This will also require the rebuilding of the substructure.

KNOXVILLE, TENN.—The Tennessee Legislature has passed a bill authorizing the city to issue \$400,000 of bonds for improvements which include some bridges. F. J. Moreland, City Engineer.

A viaduct 800 ft. long is proposed on the Knoxville, La Follette & Jellico R. R. Cost, \$75,000.

LAWRENCE, MASS.—The Boston & Maine, according to report, is making plans for the bridge to be built at Union street.

LEE, MASS.—The bridge over the Housatonic River, owned by the Berkshire Street Ry., has just been wrecked and a new one must be put in at once. It will be a steel structure 100 ft. long. R. D. Gillette, Pittsfield, Mass., is President of the road.

LEWIS BLUFF, ALA.—A bill was introduced in the U. S. Senate and House of Representatives last week authorizing a railroad bridge across the Tennessee River at a point between Lewis Bluff, Morgan County, and Gunter'sville, Marshall County, Alabama.

LINCOLN, NEB.—Bids are wanted until noon of Feb. 23 for building all iron and wooden bridges needed by

Lancaster County during the year 1903. Plans are on file with the County Clerk, T. A. Foye.

LOCK HAVEN, PA.—Bids are wanted Feb. 10 by the County Commissioners for a steel bridge over Fishing Creek.

LOUISVILLE, KY.—The Louisville & Nashville contemplates making extensive improvements on the line between Jellico and Corbin. Heavier rails and bridges are included in the work.

MANCHESTER, KY.—Bids are wanted March 9 by Dr. J. R. Burchell, for a steel bridge over Little Goose Creek.

MARION, ARK.—New steel bridges are being built on the Luxora branch of the St. Louis & San Francisco between Marion, Ark., and Luxora.

MASON CITY, IOWA.—The Iowa Central has submitted plans to the Council for its proposed viaduct from East State street.

MILWAUKEE, WIS.—New bids are wanted for the bridge across the Menomonee Canal to replace the present structure at Muskego avenue, the bid of the Milwaukee Structural Steel Co., \$93,800, being considered too high.

MINNESOTA.—On Jan. 24 a bill was introduced in the U. S. Senate authorizing the Secretary of the Interior to authorize a bridge across Thief River, in Minnesota.

MONTREAL, QUE.—The Montreal Bridge Co. has asked Parliament for permission to change the location of its proposed bridge over the St. Lawrence at Montreal, and to give it further time to build this bridge.

NEWPORT, PA.—The Grand Jury has disapproved the report of viewers on a new bridge at New Buffalo.

NEW YORK, N. Y.—The bids received Jan. 20 by the Aqueduct Commission for building 14 steel highway bridges over Croton Lake, were: King Bridge Co., \$369,700; United Construction Co., Albany, N. Y., \$374,070; Augustus Smith, 39 Cortlandt street, New York, \$393,125; F. R. Long & Co., Hackensack, N. J., \$409,450.

The revised plans for the Manhattan bridge (No. 3) made by Henry F. Hornbostel, consulting architect of the Bridge Department, will be sent to the Municipal Art Commission for approval within a week or two. Mr. Hornbostel's plans call for many tall pinnacles with electric lights at the top of each tower. The masonry anchorages will have at intervals arches cut through them and Mr. Hornbostel has found it possible to provide for space for public halls inside the anchorages.

NOME, ALASKA.—The U. S. Senate on Jan. 27 passed a bill authorizing the City of Nome, Alaska, to build a free draw bridge across the Snake River, the location and plans and any changes in plans to be subject to the approval of the Secretary of War.

NORRISTOWN, PA.—The Philadelphia & Reading, according to local report, has plans before the Town Council for a new bridge over the Schuylkill River here.

NORTH TONAWANDA, N. Y.—The New York Central, according to report, will put in a double track bridge over the Erie Canal and Tonawanda Creek.

OREGON CITY, ORE.—The Oregon City & Suburban has asked the Legislature for permission to build a suspension bridge over the Willamette River. It is said the cost will reach \$40,000.

OTTAWA, OHIO.—The Commissioners have under consideration petitions for four bridges. A decision will probably be reached soon. O. C. Talbott, County Surveyor.

OTTAWA, ONT.—The city is considering ordering the Canada Atlantic, the Canadian Pacific and the Ottawa Electric R. R., to assist in paying the cost of widening the Somerset street bridge, which it is proposed to widen by 24 ft.

PARIS, ILL.—Bonds to the amount of \$4,500 are to be issued for a bridge at Campbells Ford.

PARKERSBURG, W. VA.—Mr. Blair, of the Little Kanawha, is reported as saying that the contract for the bridge over the Ohio at Parkersburg will be let soon. The bridge will span the Ohio a short distance below Blennerhassett Island. It will be of steel and masonry, with a channel span 650 ft. long and 90 ft. above low water. Its estimated cost is a little less than \$1,000,000.

PARKVILLE, MO.—The House Committee on Commerce has reported favorably the bill authorizing the Kansas City, Parkville & St. Joseph Electric Ry. to build its proposed bridge over the Missouri River at Parkville.

PITTSBURGH, PA.—A bill has been introduced in Congress to allow the Pittsburgh, Carnegie & Western R. R. to build a bridge over the Allegheny River from a point 75 ft. east from the corner of Fourth street and Duquesne Way, for the Wabash extension through Pittsburgh to Allegheny.

POCAHONTAS, ARK.—The Bridge Commissioners and R. H. Black, County Judge, are considering building a combination bridge over Elevenpoints River to be about 800 ft. long. The date on which to get bids will probably be set soon.

PORTAGE, WIS.—The town of Lewiston will build a steel bridge over the Big Slough. The county will pay half of the cost. O. C. Cushman, of Lewiston, is chairman of the Board of Supervisors. C. E. Corning is County Surveyor.

PORTLAND, MICH.—Bids are wanted Feb. 26 for the bridge over Grand River here. It is to consist of two 112-ft. spans on tubular piers. J. T. Argell, of Belding, will receive the bids.

PORTLAND, ORE.—There is a movement on foot to replace the Morrison street bridge with a substantial structure. There is talk of building a rolling lift bridge.

PORTSMOUTH, N. H.—Reports state that a suspension bridge is proposed over Piscataqua River. The estimate made by W. H. Keepers is \$230,000.

QUEEN ANNE'S COUNTY, MD.—The Commissioners of this county have decided to build a steel bridge over Kent Narrows.

REMINGTON, VA.—The contract for building the bridge over the Rappahannock at Remington has been let to the Virginia Bridge & Iron Co., of Roanoke.

ST. CHARLES, MO.—On Jan. 24 the U. S. Senate passed a bill authorizing the Iowa & Missouri Railway to build a draw bridge across the Missouri River between St. Charles and St. Louis Counties to be located within 10 miles of the corporate limits of St. Charles and not less than one mile from any existing bridge. The bridge is to be a post route and to have an elevation not less than 55 ft. above high water; it is to have straight girders



and a main channel span, and not less than three other spans, to give at least 400 ft. in the clear at low water. The railroad company shall maintain a depth of water through the draw spans not less than that now existing.

**ST. PAUL, MINN.**—The contract for building the abutments for the Arcade street bridge is let to Newman & Hoy, St. Paul, at \$23,369.

**ST. MARYS, ONT.**—Bids are wanted by L. Hartstone, Town Clerk, Feb. 16, for building the steel superstructure of a 178-ft. bridge over the River Thames.

**SAGINAW, MICH.**—A bill has been introduced in the State Legislature authorizing the expenditure of \$200,000 for a bridge at Genesee avenue in this city, but, we are told, it is probably only for the purpose of amending the enabling act which gives the city the same authority at the present time, but it is in question and is before the Supreme Court of Michigan to be heard on Feb. 3. There may be some information as to the construction of this bridge after the Court hands down its decision. R. W. Roberts, City Engineer.

**SILVER CREEK, NEB.**—Bids are wanted Feb. 17 by C. F. Newmeyer at Central City for a bridge over Prairie Creek at Silver Creek.

**TENNESSEE.**—A bill authorizing the Knoxville, Lafollette & Jellico R. R. Co. to build a bridge across the Clinch River, in Tennessee, has been passed by the U. S. Senate and House of Representatives and signed by the President.

**TIPTON, IOWA.**—We are told that the county has in view some small bridges. W. A. Hammon, County Auditor.

**UTICA, N. Y.**—Paul Schultz, City Engineer, writes that the bridge to be built over the Mohawk at the foot of Genesee street will be done by his department.

**WALNUT GROVE, CAL.**—The Supervisors of San Joaquin and Sacramento Counties have let a contract to A. W. Burrell, of Oakland, to build the joint county steel draw bridge over the Mokelumne here. It will have a 200-ft. draw and the cost will be \$13,948.

**WASHINGTON, D. C.**—An amendment has been proposed to the District of Columbia appropriation bill continuing the construction of the Rock Creek bridge on Connecticut avenue extended, and giving the Commissioners of the District of Columbia authority to make a contract for the bridge at a cost not to exceed \$850,000 in addition to the amount already appropriated, and appropriating \$100,000 toward the work.

**WILLIAMSPORT, PA.**—McHenry Township has declined to bear its share of the cost of erecting an iron bridge over Pine Creek at Slate Run, and the bridge may be built at another location.

The King Bridge Co. has declined to cancel the contract it entered into with the retiring Board of County Commissioners for the erection of a new bridge in Franklin Township.

#### Other Structures.

**ASHTABULA, OHIO.**—The Pennsylvania Company has authorized a coal handling plant at Ashtabula in connection with the new docks and harbor improvements recently begun. The McMyer Company is reported to have the contract, which amounts to \$50,000.

**BARBERTON, OHIO.**—A large plant is to be built at Barberton by the Pittsburgh Valve & Fittings Co. When the present work is completed, two more buildings will be added.

**BAY CITY, MICH.**—The car barns of the Consolidated Ry. Co. were destroyed by fire Jan. 28. Sixteen cars, some snow plows and wrecking cars were destroyed.

**CAPE MAY, N. J.**—Local reports state that the railroads reaching this place propose to build a union station.

**CARTERSVILLE, GA.**—Plans have been completed for a cement plant to be built at Cartersville. The company is known as the Georgia Portland Cement Co., and is capitalized at \$1,500,000.

**CHARLESTOWN, W. VA.**—The Chesapeake & Ohio will begin work in the spring on its new \$60,000 passenger station in Charleston.

**CLARKSBURG, W. VA.**—It is said negotiations are under way to build a large boiler works at Clarksburg. W. T. Urie, of Kansas City, Mo., is interested.

**CLEVELAND, OHIO.**—Plans are being made for a large foundry to be built this spring by the Snyder-Hughes Co., manufacturers of steam pumps. See also Erie, Pa.

**COLUMBUS, OHIO.**—A blast furnace will probably be built by the Buckeye Malleable Iron & Coupler Co.

**CORRY, PA.**—An addition will be built to the plant of the McInnes Steel Co., Ltd., manufacturers of self-hardening steel and hammered tool steel.

**DES MOINES, IOWA.**—Work has been begun on the new buildings for the Des Moines Bridge & Iron Works. The first structure will be 80 x 100 ft. and of fireproof construction.

**DOUGLAS, TEXAS.**—Frank Powers, of El Paso, has a contract from the El Paso & South Western to build a \$25,000 roundhouse at Douglas.

**EAGLE GROVE, IOWA.**—A report that the Chicago & North Western is to build an engine house at Eagle Grove is rather premature. Plans have been made for consideration only; nothing further is decided.

**EAST ST. LOUIS, ILL.**—The St. Louis Steel Forge & Iron Works is making plans for a new steel plant to cost \$800,000. It will include three open-hearth steel furnaces of about 40 tons capacity each, blooming mill, soaking pits, etc. A power plant is also to be built.

**EL PASO, TEXAS.**—A 10-stall roundhouse will be built here for the El Paso & South Western at a cost of \$10,000 as soon as the work at Douglas is finished.

**ELWOOD CITY, PA.**—Three new buildings are to be built as an addition to the plant of the Steel Car Forge Co.

The Standard Engineering Co. has begun work on its new plant at Elwood City. The company will make gas engines and machinery of various kinds.

**ERIE, PA.**—The Pennsylvania Company has authorized new electric power plants at Cleveland, Ohio, and at Erie, to cost \$115,000 and \$27,000 respectively.

**GLENWOOD, PA.**—The Baltimore & Ohio has let contracts to the Pittsburgh Construction Co. for a coal and

ash handling plant at Glenwood. The work will cost \$50,000.

**LIVINGSTONE, MONT.**—The Northern Pacific R. R., according to report, is considering building a foundry at its shops at Livingstone.

**MCKEESPORT, PA.**—W. B. Schiller, President of the National Tube Co., is reported as stating that the U. S. Steel Corporation has authorized the purchase of land in McKeesport necessary for the new \$10,000,000 tube plant to be built there.

**MONTREAL, QUE.**—The Canadian Pacific Ry. has received permits from the Building Inspector to build two structures to form part of its shops in the eastern section. The value placed upon these buildings is \$490,000. The buildings will be of pressed brick, one story high, and will consist of a boiler shop 440 x 132 ft.; machine and erecting shop 903 x 162 ft. The contractors for both of these are Messrs. Wm. Grace & Co., of Chicago. Messrs. Lassard & Harris, of Montreal, will have charge of building the blacksmith shop, which will be 600 x 130 ft.

**NASHVILLE, TENN.**—The Nashville Building & Construction Co. has begun work on its plant in Shelby Bottoms. This company is to engage in structural steel construction and bridge work. There is a report that it is affiliated with the American Bridge Co.

**NEW CASTLE, PA.**—The New Castle Forge & Bolt Co. will build a 70 x 300 ft. steel and brick building and will install new bolt and rivet machines, with the expectation of doubling the capacity.

**NEW YORK, N. Y.**—The Erie R. R. has filed plans with the Bureau of Buildings, Borough of Manhattan, for a two-story brick freight house to be built at the northwest corner of Twenty-eighth street and Eleventh avenue, where a freight yard is to be established.

**OGONTZ, PA.**—The Standard Pressed Steel Car Co., recently organized, proposes to locate at Ogontz. Howard T. Hallowell, Thomas Thompson and H. J. Taylor are interested.

**PITTSBURGH, PA.**—Plans are being made by the Pittsburgh & Lake Erie for freight terminal improvements on the South Side.

**RICHMOND, VA.**—Reports state that a company is forming to build railroad cars in Richmond. It is also said that plans for the buildings have already been made.

**ROCK ISLAND, ILL.**—The Rock Island Co. has bought 900 acres of land east of this city, on which, according to report, it proposes to concentrate its mechanical departments, including the shops at Blue Island, Peoria, Cedar Rapids and Davenport, and possibly at Peoria places.

**SANDUSKY, OHIO.**—The American Drill Co., formerly of Springfield, is to locate at Sandusky.

**SHAWNEE, OKLA. TER.**—The Chicago, Rock Island & Pacific, according to report, proposes to make some extensions to its shops here.

**STRAITFORD, ONT.**—J. P. Mabey and Geo. Wettlaufer, of Stratford, propose to establish malleable iron works in Stratford. They have formed a company with \$250,000 capital.

**SYRACUSE, N. Y.**—The New York Central Railroad is to light its roundhouse, freight house and the shops at Syracuse by electricity, and W. J. Wilgus, Chief Engineer, is receiving bids until 3 p.m., Feb. 9, for the work.

**TOLEDO, OHIO.**—The Toledo Railway & Light Co. has let a contract to A. Bentley & Sons for new car sheds to be built on Central avenue. They will be 80 x 200 ft.

**TROY, N. Y.**—Bids are wanted until 3 p.m., Feb. 9, by Mr. Wilgus, Chief Engineer of the New York Central, for a system of electric lighting for the engine house, car shop, oil house and other buildings at Troy.

**VIDALIA, GA.**—The Railroad Commission is considering plans for the new station to be built here at the junction of the Macon, Dublin & Savannah and the Seaboard Air Line.

**WASHINGTON, D. C.**—The Supervising Architect of the Treasury last week let to Cramp & Co., of Philadelphia, for \$159,176, the contract for the second, and larger, of the group of buildings for the National Bureau of Standards. The bids, eight in all, were opened on Jan. 20, and ranged from \$159,176 to about \$238,000. The building just let will be four stories with basement and attic. It will be located on the Pierce Mill road near Connecticut avenue, extended, and near the other building for the Bureau which is already under construction.

**WASHINGTON, OHIO.**—Contracts have been let to Tate, Jones & Co., of Pittsburgh, for a coaling station for the Pennsylvania Company. The bins will have a storage capacity of 500 tons of coal and four engines can be loaded at one time.

#### MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad associations and engineering societies see advertising page avi.)

#### American Society of Civil Engineers.

At the regular business meeting of the Society on Wednesday, Feb. 4, at 8:30 p.m., there was an informal discussion on "The Preservation of Materials of Construction."

#### Canadian Railway Club.

At the regular meeting of the Club held at the Windsor Hotel, Montreal, on Tuesday, Feb. 3, discussion was continued on the paper by Mr. Gus. Giroux on "Piece Work." The new paper was "Overloading Locomotives," by Mr. G. J. Bury, General Superintendent, Canadian Pacific Ry., North Bay, Ont.

#### The Engineers' Club of Philadelphia.

A business meeting of the Club will be held on Saturday, Feb. 7, 1903, at 8 o'clock p.m. The paper is "Apparatus for, and Methods of Treating Wood to Protect it From Fire, and Preserve it From Decay." Illustrated. By Joseph L. Ferrell.

Annual meeting was held Jan. 17, and the following officers elected for 1903: President, Edwin F. Smith; Vice-President, Horatio A. Foster; Secretary, J. O. Clarke; Treasurer, Geo. T. Gwilliam; Directors (for two years), James B. Bonner, D. A. Hegarty, Geo. Neville Leiper.

#### National Geographic Society.

At a meeting of this Society in Washington on Jan. 31 the following members of the Board of Managers were elected to take the places of those whose terms had expired: C. J. Bell, George Davidson, W. M. Davis, John Joy Edson, G. K. Gilbert, A. J. Henry, O. P. Austin and C. Hart Merriam. After the election, Prof. A. C. True read a paper on the office and functions of agricultural experiment stations, and Prof. Elwood Meade, of the Agricultural Department, gave a description of the work of that department in irrigation investigations in the west.

#### Railway Club of Pittsburgh.

At the regular meeting of the Railway Club of Pittsburgh, held Friday evening, Jan. 23, a suggestion was made that correspondence be opened with all mechanical Railroad Clubs in the country with a view of forming a General Subject Committee, to be composed of one member appointed by each club, whose duties would be to meet at some given point and arrange a list of subjects for the year; all clubs to have a paper and discussions on the same subject in the same month, it being believed that by this means a better and more thorough understanding would be had of the subject, due to a larger number of opinions being given and coming from various parts of the country, and often-times under varying conditions.

The papers prepared under this arrangement would be largely competitive and would result in bringing out the best efforts of the writer. The same would be true of the discussions. The competition of work of all the clubs would be a valuable reference to one seeking information upon any subjects that had been considered in the manner described. The proposition met with general approval from those present, and as a result, the following resolution was passed:

Resolved, That the Secretary correspond with the various Club Secretaries, advising them of the action taken, and requesting that they lay the matter before their respective clubs at their next regular meeting for consideration.

J. D. Conway is Secretary.

#### PERSONAL.

—Mr. James Barker, at one time General Passenger Agent of the Missouri, Kansas & Texas Railway, died Jan. 30. He was born in 1840 at Nantucket, Mass.

—Mr. George T. Lanphear, who from 1878 to 1880 was Chief Engineer of the Pawtuxet Valley Railroad, died at South Kingston, R. I., Jan. 28, aged 63 years.

—The successor to Mr. Wilgus as Chief Engineer of the New York Central & Hudson River Railroad, Mr. Henning Fernstrom,

is a native of Sweden. He was born in 1857 and was educated at a technical school and the Institute of Technology at Stockholm. For four years he practiced in Sweden as apprentice, draftsman and Assistant Engineer. Coming to America, he was, during the year 1880, a draftsman in an engineer's office at Boston. The next year (1881) he was instrumentman and Assistant Engineer for the Minneapolis & St. Louis, and in 1882 held a similar position on the Minnesota Central. The following year he became Assistant Engineer of the Minnesota & North Western and continued with this company and its successor companies as Chief Engineer in charge of Construction and Maintenance of Way until August, 1900. In September of that year he was made Chief Engineer of the St. Joseph & Grand Island, later going to the New York Central as Principal Assistant Engineer, from which position he has just been promoted. Mr. Fernstrom is a member of the American Society of Civil Engineers, the American Railway Engineering and Maintenance of Way Association, the Western Society of Engineers and the Civil Engineers Society of St. Paul.

—Mr. F. E. Dewey, who has just become General Superintendent of the St. Louis, Memphis & Southeastern Rail-



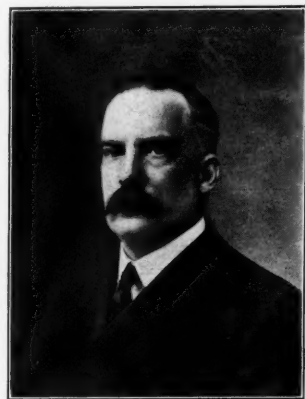
road and the St. Louis & Gulf Railway, is 45 years old. Mr. Dewey has been in railroad service for the past 28 years, beginning as a messenger boy in the Auditor's office of the Central Vermont, and for a number of years he was connected with various New England roads. In 1891 he was made Assistant Superintendent of the Western Division of the New York & New England, and on the absorption of that road by the New Haven system Mr. Dewey was made Superintendent of the Midland Division. In 1899 he was appointed General Manager of the Detroit & Lima Northern, now the Detroit Southern.

—Mr. Edwin W. Winter has accepted the Presidency of the Brooklyn Rapid Transit Company, but we feel justified in saying that he has done so reluctantly, with a thorough appreciation of the difficulties of the situation, and rather from a desire to help his friends than because of any ambition to take up hard and confining routine work. Since he resigned the Presidency of the Northern Pacific he has been active in various enterprises, principally because he is so useful a man that people are not



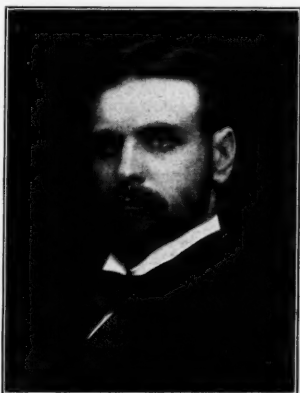
willing to let him enjoy the leisure which he has earned and which he would like to be allowed to enjoy. He was Chairman of the Cleveland, Lorain & Wheeling, and overhauled that property pretty well both physically and financially, before it was sold to the Baltimore & Ohio. He was President also of the Chicago Transfer & Clearing Co. For two years or more he has been a confidential adviser for the Directors of the Brooklyn Rapid Transit and has been helping to untangle that complicated skein. We should not suppose that he looks forward to a long tenure of his present office, but on this point we cannot speak with authority. We feel pretty confident, however, that he will have very little to say to the public as to his intentions, but that he will let the results speak for themselves. One of the newspapers reports him as having said to a reporter who asked for his photograph (and did not get it), "The only interest that the public has in my personality is what they are going to get for a nickel."

—The new Fourth Vice-President of the New York Central & Hudson River Railroad, Mr. John Carstensen,



was born in 1854 in New York city and was educated at the Cayuga Lake Academy and at the Alexander Military Institute at White Plains. Mr. Carstensen was Treasurer of the New York Central under Mr. C. C. Clark, ex-First Vice-President (retired), then for some years he was Paymaster, later becoming Assistant Treasurer, and about 1889 he became Comptroller and has discharged the duties of that office up to the present time. With Mr. Carstensen's promotion the office of Comptroller is abolished and Mr. M. L. Bacon has been appointed Auditor. Mr. Carstensen is President of the Norfolk & Southern and Vice-President of the Norfolk & Portsmouth Belt Line. His advancement to a Vice-Presidency of a system with which he has been connected all his business life is another important instance of the desire of the present management to find good material within the ranks of the organization.

—Mr. William J. Wilgus, who has just been appointed Fifth Vice-President of the New York Central & Hud-



son River Railroad, was born in Buffalo, N. Y., in 1865, and is a graduate of the Buffalo High School, and took two years' special study in Civil Engineering. His railroad service dates from August, 1885, when he began with the Minnesota & North Western, passing through the various grades from rodman to Division Engineer in charge of the Leavenworth & St. Joseph extension and the Kansas City terminals. In 1891 he was Resident Engineer of the Chicago Union Transfer Railway, and in 1892 was Locating Engineer for the Duluth & Iron Range. Mr. Wilgus's service with the Central has been since 1893, when he began as Assistant Engineer of Maintenance of Way on the Rome, Watertown & Ogdensburg (New York Central System). He has held the positions of Chief Engineer of the Terminal Railway of Buffalo, Resident Engineer of the Eastern Division, Chief Assistant Engineer all lines, Engineer of Maintenance of Way and Chief Engineer. Mr. Wilgus is a member of the American Society of Civil Engineers, the Century Club and several other important societies and clubs.

—Mr. Lincoln Bush, the new Chief Engineer of the Delaware, Lackawanna & Western, was promoted to that position from Principal Assistant Engineer. He was born on a farm in Palos, Ill., in 1861. After graduating from the Cook County Normal School at Englewood, in 1880, he taught in the schools of that county for three years. Mr. Bush is a graduate of the University of Illinois (Civil Engineer), class of '88, and from then until 1890 he was Assistant Engineer for the Union Pacific and on the location survey of the Pacific Short Line, between Oden, Utah, and Green River, Wyo.



For one year (1890-1891) he was Assistant Engineer at Chicago for Mr. E. L. Corthell, on shop and field bridge work. For the five years following he had charge of the drafting, estimating and designing department of the Western office of the Pittsburg Bridge Company at Chicago, and in 1899 he was appointed Division Engineer of the Iowa Division for the Chicago & North Western at Boone, Iowa. Mr. Bush came to the Lackawanna from the North Western in December, 1899, as Bridge Engineer, being made Principal Assistant Engineer in October the following year, retaining his former duties of Bridge Engineer. In March, 1901, the work of the Superintendents of bridges and buildings was placed under his supervision, which work, in addition to his duties as Principal Assistant Engineer and Bridge En-

gineer, he has handled up to the time of his new appointment as Chief Engineer. In our issue of Nov. 14, 1902, an account is given of the practical rebuilding of the Lackawanna which has been done since the change in management took place, in 1899. The efforts of Mr. Bush have been largely instrumental in carrying this out, especially in regard to the bridge work, and the method which he employed of utilizing the old structures as false work for the new.

—Mr. Daniel Willard, who on Jan. 28, was elected First Vice-President and General Manager of the Erie Railroad and the New York, Susquehanna & Western, began his railroad career in 1879 in the track department of the Vermont Central.

Mr. Willard was born in North Hartland, Vt., in 1861, and was graduated from the Windsor High School in 1878. From 1879 to 1883 he was with the Passumpsic road as fireman and engine-man, but resigned from this position to go with the Lake Shore & Michigan Southern as locomotive engineer, later assuming similar duties on the Minneapolis, St. Paul & Sault Ste. Marie. He was then made Trainmaster and Superintendent, and in 1899 was appointed Assistant General Manager of the Baltimore & Ohio. In May, 1901, Mr. Willard came to the Erie as Assistant to the President, but was later elected Third Vice-President in charge of the operating department, and from which position he has just been elected to the First Vice-Presidency and General Managership.



#### ELECTIONS AND APPOINTMENTS.

**Atlanta, Knoxville & Northern.**—J. E. W. Fields, Traffic Manager, with headquarters at Knoxville, Tenn., has resigned.

**Baltimore & Ohio.**—See Erie.

**Brooklyn Rapid Transit.**—E. W. Winter will succeed Mr. Greetsinger (resigned) as President. Those who know Mr. Winter best do not think that he can have decided to take this position except to help his friends over a hard place. He long ago resolved not to take up routine official duty again, and has refused many important positions in the last two or three years. The new Directors are as follows: John G. Jenkins, Horace C. Duval, H. Somers Hayes, David H. Valentine; two years, Norman B. Ream, Edwin W. Winter, Henry Siebert, T. S. Williams; three years, A. N. Brady, H. H. Porter, E. H. Harriman, W. C. Oakman and A. R. Flower.

**Chicago & Erie.**—See Erie.

**Chicago, Rock Island & Pacific.**—C. H. Cannon, heretofore Superintendent of Car Service for the Great Northern, has been appointed Car Service Agent of the C., R. I. & P., with headquarters at Chicago, succeeding E. E. Betts, resigned. S. F. Forbes has been appointed Assistant Purchasing Agent, with headquarters at Chicago.

W. E. Dauchy, Chief Engineer, with headquarters at Chicago, Ill., has resigned.

**Delaware, Lackawanna & Western.**—Andrew J. Neafie has been appointed Principal Assistant Engineer, succeeding Mr. Bush, and Alvin E. Deal becomes Bridge Engineer. Patrick Dowling has been appointed General Roadmaster, to succeed Mr. Neafie, effective Feb. 1. All to have headquarters at Hoboken. The heads of the different departments under the Chief Engineer will report as heretofore, except as follows: The Bridge Engineer, Superintendents of Bridges and Buildings, and Superintendent of Buildings and Docks, will report to the Chief Engineer; the General Roadmaster, General Foreman of Kingston shops, and Tie and Timber Agent will report to the Principal Assistant Engineer, and the Shop and Mill Inspectors of Structural Steel, and General Inspector of Bridges will report to the Bridge Engineer.

**Erie.**—Daniel Willard, heretofore Third Vice-President, was on Jan. 28, elected First Vice-President and General Manager of this company and the New York, Susquehanna & Western. H. B. Chamberlain on the same date was elected Third Vice-President and General Traffic Manager. Mr. Chamberlain was formerly Freight Traffic Manager. John C. Stuart, formerly General Superintendent of Transportation of the Baltimore & Ohio, has been appointed General Superintendent of the Ohio Division of this company and the Chicago & Erie, succeeding Henry E. Gilpin, transferred. (See New York, Susquehanna & Western.)

S. P. Shane, heretofore Assistant Freight Traffic Manager, has been appointed Freight Traffic Manager, succeeding Mr. Chamberlain.

**Grand Trunk.**—W. D. Hall has been appointed Electrical Engineer, with headquarters at Montreal, effective Feb. 1.

**Great Northern.**—Max Toltz, Mechanical Engineer, with headquarters at St. Paul, Minn., has resigned. John Dickson, Superintendent of Shops at Everett, Wash., has resigned. Wm. Kelly, heretofore Master Mechanic at Everett, Wash., has been appointed General Master Mechanic of the Western District, with headquarters at Spokane, Wash., succeeding George H. Emerson. Wm. Ball has been appointed Master Mechanic of the Northern Division, with headquarters at Grand Forks, N. D. T. J. Clark has been appointed Master Mechanic, succeeding Mr. Kelly. C. H. Cannon, Superintendent of Car Service, has resigned. Roadmaster J. J. Hess has been assigned additional duty as Assistant Superintendent at Havre, Mont. (See Chicago, Rock Island & Pacific.)

**Hannibal & St. Joseph.**—C. M. Carter has been appointed Assistant Treasurer, with headquarters at St. Joseph, Mo., succeeding J. H. Sturgis.

**Indiana, Illinois & Iowa.**—F. C. Raff, General Superintendent, with headquarters at South Bend, Ind., has resigned.

**Louisville & Nashville.**—E. W. Hines has been appointed General Attorney.

**Mexican Central.**—Isaac Mathewson has been appointed Assistant to the Chief Engineer, with headquarters at Mexico, Mex.

**New York Central & Hudson River.**—John Carstensen, heretofore Comptroller, has been appointed Fourth Vice-President, with offices in this city, to have general supervision of the accounting department and such other powers and duties as may from time to time be assigned to him by the President, subject to the approval of the Board of Directors or of the Executive Committee. W. J. Wilgus, heretofore Chief Engineer, has been appointed Fifth Vice-President, with office in New York. Mr. Wilgus, under the direction of the President, will have general charge and supervision of all construction work; shall assist the Third Vice-President in matters pertaining to the maintenance of way and structures, and shall perform such other duties as may be assigned to him from time to time by the President, subject to the approval of the Board of Directors, or of the Executive Committee. H. Fernstrom, heretofore Assistant Chief Engineer, succeeds Mr. Wilgus as Chief Engineer, with headquarters at New York. The office of Comptroller has been abolished and Marshall L. Bacon has been appointed Auditor. He will have supervision of disbursements, freight, passenger and general accounts. Mr. Bacon's headquarters will also be in New York. R. P. Mills has been appointed Acting Supervisor of Buildings on the Eastern Division, succeeding J. E. Johnson, resigned. George A. Berry succeeds F. L. Chase (resigned) as Engineer of Bridges, and Jens H. Holst in turn succeeds Mr. Berry as Assistant Engineer of Bridges.

**New York, New Haven & Hartford.**—J. W. Miller has been appointed General Manager of the Marine District, reporting to the President. Mr. Miller will have charge of the operation, maintenance and repairs of all steamboat lines and floating equipment, except that the operation of the Lighterage Department will continue under the supervision and control of the operating department of the Railroad Company, as heretofore.

**New York State Railroad Commission.**—J. M. Dickey, of Newburgh has been appointed a member of the Commission to succeed Ashley W. Cole. The term is for five years.

**New York, Susquehanna & Western.**—Henry E. Gilpin has been appointed General Superintendent, with headquarters at Jersey City. G. A. Richardson has been elected Assistant to the President and Secretary. David Bosman has been elected Assistant Secretary, succeeding L. D. Smith, resigned, effective Feb. 1. (See Erie.)

**Pere Marquette.**—A. M. Smith has been appointed General Superintendent, with headquarters at Detroit, Mich., succeeding S. T. Crapo, resigned. Mr. Smith will also have charge, temporarily, of the Purchasing Department, succeeding H. D. Norris, resigned.

**Pittsburgh & Lake Erie.**—W. A. Terry, heretofore Assistant General Freight Agent, has been appointed General Freight Agent, with headquarters at Pittsburgh, Pa.

**St. Louis & Gulf.**—See St. Louis, Memphis & Southeastern.

**St. Louis & San Francisco.**—S. T. Fulton has been appointed Assistant to the Vice-President, operating department, with headquarters at St. Louis, Mo.

**St. Louis, Memphis & Southeastern.**—D. H. Nichols has been appointed Superintendent of the St. L., M. & S. E. (Cape Division) and the St. Louis & Gulf, with headquarters at Cape Girardeau, Mo. W. B. Spaulding has been appointed General Claim Agent, with headquarters at St. Louis, Mo.

**Southern.**—Sumner J. Collins has been appointed General Superintendent of the Eastern District, with headquarters at Salisbury, N. C., succeeding J. H. Sands, resigned. We are informed that the newspaper reports which state that Mr. Sands is to go with the Norfolk & Western as General Manager are erroneous. John J. Bayly has been appointed Master Mechanic of the Memphis Division and of the Northern Alabama, with headquarters at Sheffield, succeeding M. W. Elliott, resigned. Charles W. Lee becomes Master Mechanic of the Norfolk Division, succeeding Mr. Bayly. Mr. Lee's headquarters will be at Lawrenceville, Va.

**Texas & Pacific.**—G. M. Lovett, heretofore General Foreman at Longview Junction, has been appointed Master Mechanic, with headquarters at Texarkana, Texas, succeeding the late Mr. Laing.

**Texas State Railroad Commission.**—L. J. Storey has been elected Chairman to succeed J. H. Reagan, retired. O. B. Colquitt has been appointed a Commissioner.

**Union Depot Bridge & Terminal.**—George H. Ross has been elected President, with headquarters at Kansas City, Mo.

**Western Maryland.**—Henry A. Bishop has been appointed Acting Vice-President of this company and the West Virginia Central & Pittsburgh, with headquarters at Baltimore.

**West Virginia Central & Pittsburgh.**—See Western Maryland.

#### RAILROAD CONSTRUCTION.

##### New Incorporations, Surveys, Etc.

**AKRON, STERLING & NORTHERN.**—On Jan. 24, 1903, the United States Senate passed the bill extending the time for the building of this railroad in Alaska. The proposed route is from the head of Aldez Bay, Alaska, through Dutch Valley, to Thomas Pass. G. W. Holdredge, of Omaha, Neb., is one of the incorporators.

**ALABAMA ROADS.**—It is said that the first 15 miles of the proposed road from Flat Creek via Alabama River to Greenville, 45 miles, has been completed, and that trains are now running on this section. J. J. King, Selma, Ala., is the contractor.

**APALACHIA & CLEVELAND.**—This line is now building between Apalachia and Cleveland, Tenn., 35 miles. W. H. Petty, Foreman of the Cherokee Land Co., is the contractor. Grading has been completed to Gohanns Cove, three miles. An extension north to Tellico Plains, 10 miles, is projected. (Official.)

**ARKANSAS COAL & MINERAL.**—Articles of incorpora-



tion have been filed by this company in Tennessee. It is proposed to build from Dyer through the coal districts of Huntington for a distance of about 50 miles. E. T. McConnell and J. J. Goldsby, of Huntington, Tenn., are the principal stockholders.

**ARKANSAS, SPRINGFIELD & NORTHWESTERN.**—An officer writes that this line is now built from Springfield to a connection with the Kansas City line near Versailles, 121 miles. The Federal Construction Co., of Kansas City, Mo., are the contractors. (Jan. 2, p. 17.)

**ARLINGTON & PACIFIC COAST.**—Articles of incorporation were filed by this company on Jan. 19 in Oregon. It is proposed to build from Arlington south to Fossil, 60 miles, and eventually across the Cascade range to Florence, in Lane County. J. P. Finley and J. E. Simmons, of Portland, Ore., interested.

**ATLANTIC & WESTERN.**—It is reported that work is in progress on the proposed line from Goldsboro, via Sanford, to Concord or Salisbury. W. J. Edwards, of Sanford, N. C., is President.

**BALTIMORE & OHIO.**—Press reports state that this company is planning a cut-off from Wheeling, W. Va., through Green County, Pa., to the Fayette County coke region. Surveys are reported completed.

**BELLINGHAM BAY & BRITISH COLUMBIA.**—Press reports state that this road has completed the line from Maple Falls, B. C., to Nooksack River. Contract for the extension from Maple Falls to the forest reserve, 7½ miles, has been let to Nelson & White, Seattle, Wash. Grading is practically completed and track laying will be finished early in the spring. (July 11, 1902, p. 561.)

**BERLIN, WATERLOO, WELLESLEY & GEORGIAN BAY.**—Application will be made at the next session of Parliament to incorporate a company to build from Berlin to Waterloo, Ont., thence to Wellesley and Markdale to a terminus at Collingwood. D'Arcy Scott, Ottawa, Ont., is interested.

**BRUCE MINES & ALGOMA.**—An officer writes that this road from Bruce Mines, via Rydal Bank and Gordon Lake to Rock Lake, 18 miles, has been completed. A regular passenger and freight service will be installed in a few days. A. S. Burrows, Bruce Mines, Ont., is General Manager.

**CHESAPEAKE & OHIO.**—The Wolfe Creek branch is being extended from Carlisle, W. Va., via Oak Hill, to Parral and Stuart, two shafts of the Stuart Colliery Co., a distance of about seven miles. Grading was begun on Jan. 1, 1903, by the contractor, T. J. Swift, of Scarborough, W. Va. C. W. Johns is Chief Engineer. (Official.)

**CHICAGO, INDIANAPOLIS & ST. LOUIS.**—This line has been incorporated to build from Hillsboro, in Montgomery County, in a southwesterly direction, through the counties of Montgomery, Macoupin and Madison, to Mitchell, Mo. E. Ingalls and C. E. Schall, of New York; G. M. French, Hadley Baldwin and W. M. Duane, of Mattoon, Ill., are incorporators.

**CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.**—Contract has been let to McArthur Bros., of Chicago, Ill., to grade the second track from Pana to Hillsboro, Ill., 20 miles, and from Hillsboro to Mitchell, 48 miles. J. Duffy may be addressed at Hillsboro, Ill. (Nov. 28, 1902, p. 917.)

**COLORADO & SOUTHERN.**—Press reports state that an extension from Fort Collins to Wellington, Colo., a distance of 11 miles, is now being built. H. W. Gowen, Denver, Colo., is Chief Engineer.

**DENVER, EL RENO & NEW ORLEANS.**—This company has been incorporated in Oklahoma to run through Beaver, Woodward, Dewey, Blaine, Cleveland and Potawatomi Counties in Oklahoma, with headquarters at El Reno.

**DES MOINES, IOWA FALLS & NORTHERN.**—It is reported that the city of Nevada, Iowa, will refuse to pay its share of the \$76,000 voted as a subsidy to the Des Moines, Iowa Falls & Northern by the townships in Story County, on the condition that the road should be in operation into Des Moines by Jan. 1, 1903. The railroad did run one train into Des Moines on Jan. 1, 1903, but it has since been unable to run trains regularly, as the roadbed was not properly ballasted. (Jan. 16, p. 55.)

**EASTERN ILLINOIS & ST. LOUIS.**—Articles of incorporation have been filed by this company in Illinois. It is proposed to build from a point on the Indiana State line through the counties of Iroquois, Vermillion, Douglas, Moultrie, Montgomery, Macoupin and St. Clair to East St. Louis. The incorporators and first board of directors are E. H. Seneff, J. P. Reeves, H. F. Jones and F. W. Krohn, all of Chicago.

**FAIRMONT & COLFAX SHORT LINE.**—Charter has been asked for this company to build between Fairmont and Colfax, W. Va., five miles. M. L. Hutchinson, B. G. Williams and W. H. Spragg, of Fairmont, W. Va., are incorporators.

**FLORENCE & CANYON CITY ELECTRIC.**—The correct name of the road is the above, and not the Florence Electric, as stated in our last issue. A mortgage has been filed by this company with the Eastern Trust Co., of New York, to secure \$2,700,000 of 5 per cent. \$1,000 25-year gold bonds, the proceeds to be used for building 125 miles of electric roads near Florence and Canyon City, Colo. Thomas Robinson is President, and H. A. Cook, Vice-President, both of Florence, Colo.

**GUYANDOTTE VALLEY.**—The sections from Huntington to Midkiff, 40 miles, and from Midkiff to Logan, 40 miles, are under contract to Carpenter, Wright & Co., of Midkiff, W. Va. Grading has been completed between Midkiff and Big Creek, 20 miles. (Official.)

**KANSAS CITY, MEXICO & ORIENT.**—An officer writes that the proposed route of this line is from Kansas City to Topolobampo, via Wichita, Anthony and Sweetwater in Texas; San Angelo, Presidio, Chihuahua and Minaca Fuerte in Mexico, a total distance of 1,630 miles. This is all under contract to the International Construction Co., the Union Construction Co., the Kaw Valley Construction Co., and the Texas Southern Construction Co. Grading has been completed between Milton, Kan., and Fairview, Okla. T. 97 miles. The line from Lone Wolf, Okla. T. to Sweetwater, Texas, 197 miles, is practically completed.

**KLAMATH LAKE.**—An officer writes that grading is completed between Laird and Dixie, Ore., 23 miles, and track has been laid between Laird and Fall Creek, 15 miles. The line is projected to Pokagon, Ore. H. Lindley, Vice-President, Klamath, Cal.

**LA CROSSE & SOUTHEASTERN ELECTRIC.**—Press reports state that contract for this road from La Crosse to

Viroqua, Wis., a distance of 30 miles, has been let to Collins & Co., of Chicago.

**LABROBE, PLEASANT UNITY & GREENSBURG STREET.**—Charter has been granted this company in Pennsylvania, to build between the points named, a distance of about 20 miles. J. B. Kenna, of Greensburg; D. W. Smith, J. L. Frebble and others, of Labrobe, Pa., are directors.

**LIBERTY-WHITE.**—This road, which was recently incorporated in Mississippi to run between the above named points, 25 miles, will be built along the old grade of a narrow gage logging road which runs between these two cities. The new road will be standard gage. J. J. White, McComb, Miss., is President. (Official.)

**LITTLE RIVER.**—An extension of this road from the forks of the Little River to Smoky Mountain, five miles, through a timber country, is being built. The road now runs between Walland, Tenn., and the forks of the Little River, 11 miles. J. W. Lockhart, Bluff City, Tenn., Chief Engineer.

**LOUISIANA R. R.**—An officer writes that the line from Crowley, via Oakdale to Natchitoches, La., 135 miles, is under contract to J. D. Beardsley, Gibsland, La. Grading is in progress.

**LOUISVILLE, ANCHORAGE & PEWEE VALLEY ELECTRIC.**—Amended articles of incorporation have been passed by this company changing its name to the Louisville & Eastern, and also providing for an increase in capital from \$350,000 to \$1,250,000. An extension was voted from Shelbyville, Ky., to Frankfort, and New Castle and to a point on the Kentucky River.

**LOUISVILLE & NASHVILLE.**—Press reports state that the line between Jacksonville, Fla., and Brent, five miles, is now being made double track. It is reported that second track will also be laid to Flomaton, 44 miles. The extra roadbed is necessary for the handling of export freight and for switching purposes.

**MANUFACTURERS JUNCTION.**—This company has been incorporated in Illinois, to build in Chicago, a distance of seven miles from West Lake street river bank to West Sixteenth street, and thence in a southwesterly direction to Lyons. C. S. Reed, L. Thompson, C. A. Ross and H. A. Rust are directors.

**MUNCIE, HARTFORD & FORT WAYNE.**—An officer writes that this line from Muncie, via Royerton, Eaton, Hartford City and Molly to Montpelier, Ind., 30 miles, is practically completed and trains will be running shortly. Contracts will be let in April for a line from Montpelier to Lufkin, Ind., and it is eventually intended to extend to Fort Wayne. S. M. Hester, Cleveland, Ohio, is President. (Aug. 1, 1902, p. 616.)

**OMAHA, DECATUR & NORTHERN.**—Articles of incorporation have been filed by this company in Nebraska. The proposed route lies through the Counties of Douglas, Washington, Burt and Dakota. C. E. Burlew, A. M. Anderson, H. H. Bone and G. H. Puss, of Omaha, Neb., are incorporators.

**ORFORD MOUNTAIN.**—It is reported that track has been laid on one mile of the extension of this line from Kingsbury to Windsor Mills, Que., and that location for the remaining 6½ miles has been made. (Dec. 12, 1902, p. 954.)

**PARAGOULD & MEMPHIS.**—An officer writes that the sections from Cardwell, Mo., to Paragould, 13 miles, and from Manila, Ark., to Osceola, 20 miles, are under contract to D. Smith & Son, Manila, Ark. J. E. Thomas, Cardwell, Mo., may be addressed. (Dec. 5, 1902, p. 944.)

**PENNSYLVANIA.**—At a recent meeting of the directors of this road the following improvements were authorized: A second track through Miami City, Ohio; purchase of land and building of tracks at Linwood, Ohio, for freight yard purposes, and erection of power and electric plants at Cleveland and Erie, Pa., respectively.

**PENNSYLVANIA ROADS.**—Bids are now being offered for the building of a branch line 3½ miles long from Cheswick, Pa., to the mines of the Allegheny Coal Co. Work will probably begin within a few weeks. The Allegheny Coal Co., of Cleveland, is behind the project.

**PHOENIX & EASTERN (SANTA FE, PRESCOTT & PHOENIX).**—The proposed route of this road is from Phoenix, via Tempe, Mesa, Florence and Dudleyville, to Benson, Ariz., 180 miles. Grading has been completed and track laid for seven miles out of Phoenix. A section of 25 miles from the present terminus has been let to Grant Bros., Los Angeles, Cal. (Official.)

**PITTSBURGH, SHAWMUT & NORTHERN.**—An officer writes that the following work is now being done by this line: The Warner Brook branch from Clermont to Kason, Pa., 7½ miles long, is graded for a distance of five miles, and will be completed early in May. The Interior Construction & Improvement Co. are the contractors, and the Lathrop, Shea & Henwood Co. are the sub-contractors. An extension from Angelica to Bolivar, 23 miles, is graded for 15 miles, and is under contract to the above companies. Bids have been asked for the improvement in alignment and grade of the Olean branch between Main and Portville, and for the building of a new line between Olean Junction and State Line Junction, two miles; also for the improvement of line and grade from Angelica to Bennetts, five miles. Extensions from Wayland to Macedon, and from Hyde to Cool Springs, are projected.

**ST. LOUIS & GULF.**—Contract for building the extension of this road from Vanduser to Zeta, Mo., a distance of 11 miles, has been let to P. H. Rogers, Cape Girardeau, Mo. The work is now in progress.

**ST. LOUIS & NORTH ARKANSAS.**—An officer writes that this road, which is building from Harrison via Bellefonte, Olvey, Gilbert and Marshall to Leslie, 55 miles, has been completed as far as Gilbert, 35 miles. The remainder of the road is under contract to Frank McGinnigle, Duff, Ark. S. W. Lee, Eureka Springs, Ark., is Chief Engineer.

**SANTA FE, PRESCOTT & PHOENIX.**—An officer writes that the Bradshaw Mountain extension from Mayer through the mining districts to Crown King, 27 miles, is under contract to Grant Bros., Los Angeles, Cal. Grading has been completed for 16 miles out of Mayer, and track laid for a distance of 12 miles.

**SENATH, RECTOR & WESTERN.**—Articles of incorporation have been filed by this company in Missouri, to build between the above named points. J. M. Karns, A. M. Douglas and J. H. Franklin, of Senath, Mo., are interested.

**SOUTHERN.**—Grading on the Warrior branch of this road from Searcy, Ala., to Lodges Mines, 13 miles, is completed, and track laying has already begun. W. J. Oliver & Co., Langley, S. C., are the contractors.

**SUMPTER VALLEY.**—An officer writes that work will begin shortly on the extension from Baker City to Whitney, Ore., 45 miles. An extension from Whitney to Greenhorn Summit, 10 miles, is projected. J. C. West, of Whitney, is interested.

**TACOTEPEC.**—Formerly operated by the Mexican Southern, is now owned by Luis Garcia Teruel, Mexico City, Mexico. Fifty miles on the extension from Tacotepec to Acatlan have been built and work on the remainder of the road is now in progress.

**TRAVERSE CITY, LEELANAU & MANISTIQUE.**—An officer writes that this line is building from Traverse City, Mich., via Hatch's, Bingham, Sutton's Bay and Omena, to Northport, Mich., 30 miles. McDonald Bros. & Co., Grand Rapids, Mich., are the contractors. Grading has been completed between Hatch's and Northport, a distance of 25 miles.

**WATERLOO & CEDAR FALLS RAPID TRANSIT.**—An officer writes that the proposed route of this road is from Denver, Iowa, via Waverly, Bremer and Tripoli, to Sumner, Iowa, 31 miles. The work is being done by the company's forces, and grading will be completed about July 1, 1903. (Oct. 17, 1902, p. 806.)

**WHEELING & GLEN SPRINGS.**—It is reported that an extension of this road from Buffalo, S. C., to Murphy's Shores, four miles, will be begun very shortly. G. M. Wright, Union, S. C., is General Manager.

**YORK & GETTYSBURG STREET.**—This company has been incorporated in Pennsylvania to build from York to Gettysburg via East Berlin, a distance of about 45 miles. C. J. Basehore is President, and E. J. Wilkes, Treasurer, both of Carlisle, Pa.

**ZANESVILLE, MARIETTA & PARKERSBURG (WABASH).**—Contracts for the extension of this road from Zanesville, Ohio, to Parkersburg, W. Va., a distance of about 70 miles, will be let within the next two weeks. When this is completed, it will form a link connecting the Little Kanawha and Wheeling & Lake Erie, both of which are under the Wabash system. J. T. Blair is President.

## GENERAL RAILROAD NEWS.

**BROOKLYN & ROCKAWAY BEACH.**—H. J. Robinson has been appointed Receiver of this road, which runs from East New York to Canarsie pier, 5½ miles. The company is forced into this receivership in default of unpaid taxes and interest due on bonds for the past two years.

**DENVER & RIO GRANDE.**—Gross earnings for the six months ending Dec. 31, 1902, were \$9,280,397, as against \$9,148,425 for the same months in 1901, showing an increase of \$131,972. The operating expenses during these six months in 1902 show a decrease of \$86,029. Net earnings in 1901 were \$3,552,606, and in 1902, were \$3,770,697, showing an increase in net earnings for the last six months in 1902 of \$228,000.

**GREAT NORTHERN.**—Press reports state that the Northern Steamship Company, which is subsidiary to the Great Northern, has been sold to a syndicate, in which the Erie, Delaware, Lackawanna & Western, Lehigh Valley, New York Central, and the Pennsylvania Railroads are represented.

**GREAT NORTHERN OF CANADA.**—Negotiations are reported for the consolidation of the Canadian Northern with this road. It is reported that Mr. Mackenzie, promoter of the Canadian Northern, has gone to England to make final arrangements for the sale of his road.

**NASHVILLE, CHATTANOOGA & ST. LOUIS.**—The gross earnings of this road for the six months ending Dec. 31, 1902, were \$4,611,521, as against \$3,916,031 in 1901, showing an increase of \$695,490. The operating expenses during these months in 1902 were \$3,232,978, and in 1901 were \$2,663,107, a decrease of \$569,871. The net earnings were \$1,378,542, an increase of \$125,619 over the last six months of 1901.

**PENNSYLVANIA.**—The loan for \$35,000,000 which was recently made by this company at 4½ per cent., has been deposited with several banks on a 3 per cent. basis. This practically gives the Pennsylvania Company the privilege of calling the loan at any time by paying 1½ per cent. interest, and insures the road against any trouble in case of a stringency in the money market. The road is now in a position to go on with the proposed tunnel schemes, and with the improvements for the relief of traffic east and west of Pittsburgh, without fear of being handicapped by insufficient funds.

**PHILADELPHIA & WEST CHESTER TRACTION.**—The Commercial and Financial Chronicle states that the recent mortgage of this road for \$600,000 was made for the following purposes: (1) To redeem the present issue of \$400,000 5 per cent. bonds; (2) to provide for the funding of the present floating indebtedness; (3) to provide for extensive improvements and additions to property. (Jan. 23, p. 74.)

**SOUTHERN.**—The gross and net earnings and operating expenses of the Southern and some of its branches for the six months ending Dec. 31, 1902, as compared with the same six months in 1901, show a rather general tendency toward increase in the ratio between expenses and earnings. The gross earnings of the Southern for the half year just ended were \$21,320,089, an increase of \$2,189,284 over 1901. The operating expenses were \$14,956,454 in 1902, and \$13,000,178 in 1901, an increase of \$1,956,275; and the net earnings show an increase of \$233,008 in 1902. The per cent. of expenses as compared to earnings during the last six months of 1902 was 70.15, while in 1901 it was 67.95. In the report of the Cincinnati, New Orleans & Texas Pacific, the ratio between expenses and earnings during the half year ending Dec. 31, increased from 73.84 in 1901, to 75.07 in 1902. The Central of Georgia also shows an increase in the ratio between expenses and earnings from 68.26 to 69.25. The Alabama Great Southern's per cent. of expenses to earnings was 69.84 during the last half of 1901, and 74.37 during the same six months in 1902.

**TROY & TIPTONVILLE.**—This road is to be sold at auction at Memphis, Tenn., Feb. 25. It runs from Rives to Tiptonville, Tenn., 4½ miles. The Illinois Central owns about half of the common stock and bonds outstanding.

**WABASH.**—It is reported that this road has bought the Attica & Covington, which runs between the points named in Indiana, a distance of 15 miles. The Wabash has operated this road for several years, but did not have a clear title to it until recently, when it secured a judgment against it. The road was sold under this judgment, the Wabash buying it in at the sheriff's sale. It is said that the road will be entirely rebuilt.